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NORTH DAKOTA EXTENSION SERVICE

FARMERS FACE FARM-MANAGEMENT FACTS IN WARD COUNTY
(North Dakota)

Lloyd E. Jones, Junior Agricultural Economist
and
Olav Rogeness, Junior Agricultural Economist
Bureau of Agricultural Economics

Washington, D. C.
February 1941

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B. E. S. APR 22 1941

FOREWORD

This report is the result of a request by the Ward County Land Use Planning Committee for material that could be used in planning work. The Committee, presented with adjustment problems, realized the need for assembling available information and developing a means of using such information as a guide to planning. Individual farm-management problems would thus be considered as a background for county-wide adjustments.

Information contained here is being used by Ward County farmers in coping with their farm-management problems. It deals with trends in agriculture, the present economic situation in the county, and the first steps being taken by Ward County farmers in confronting their farm-management problems.

The budgets contained in this report were developed by farmers of Sawyer community under the supervision of the Ward County agent with technical guidance from the authors. This assistance was furnished at the request of the Ward County planning committee. (See page 56.)

The authors appreciate the advice and counsel of members of the North Dakota Experiment Station, especially W. L. Ettesvold of the Department of Agricultural Economics, and the suggestions and constructive criticism of T. S. Thorfinnson, Leader, Division of Farm Management and Costs, Area I.

Keith H. Spencer of the Bureau of Agricultural Economics, assisted in the preparation and arrangement of statistical tables; clerical work was performed by the staff of the Division of Farm Management and Costs; and clerks under Project No. 3270 of the Works Progress Administration, sponsored by the North Dakota Experiment Station and the Extension Service. The illustrations used were prepared by draftsmen under this project.

NOTE: The illustrative material contained in this report, including the tables grouped after page 30, is an indication of the type of background information that farmer land use planning groups will find desirable. These kinds of data allow necessary factual determinations and can be rather quickly and easily assembled.

SUMMARY

Agriculture in Ward County was severely tested during the thirties. The turbulent threadbare thirties with their years of low prices, low rainfall, grasshoppers, and wind erosion, have shattered the optimistic viewpoints formerly held by the people. Farming has been unprofitable, and tenancy and mortgage foreclosure have increased materially. In view of this situation, Ward County planning groups and action agencies have raised questions pertaining to the right kinds of farming systems for the different areas of the county. For example: With no change in major types of farming now found in the county, is it possible to determine a farm-size that would provide an adequate living for farmers? Is it possible to reorganize an inadequate farm system so that it will provide a larger net income? Can farm incomes be increased by adding more milk cows, raising more chickens, or increasing the number of brood sows? What other alternatives do farmers have, and what are some of the problems facing Ward County farmers in making desirable shifts in the organization of their farm business?

The greater part of the settlement of Ward County took place from 1898 to 1918, and the county changed rapidly from a ranching economy to a cash-grain economy with some support from livestock. Wheat, the primary source of income, increased constantly up to the drought of the thirties, when the acreages of all crops were greatly reduced. Most of the crops were at their peak during the period 1920 to 1930. In 1935, 59 percent of all land in the county was in crops. During the period of settlement the kind of livestock raised changed from a ranch type to a farm type. Cattle have almost always been the most numerous of the livestock. Livestock numbers increased rapidly during the twenties, but have fallen off along with crops. Farm numbers reached their peak during the homesteading days in 1910, although the average size of farm has gradually risen since 1910. In 1935, the 2,784 farms averaged 417 acres in size. Tenancy has steadily risen since the settlement period. Annual precipitation has varied widely, ranging from 27 inches for 1892 to 7 inches in 1934, with an average of 15 inches for the period. Extremely dry weather prevailed during the thirties.

In 1938 there were 2,135 farms in Ward County. The average size was 542 acres, but 160-, 320-, and 480-acre farms were most common. Fifty percent of the farms were cash-grain farms; 28 percent were general farms; and 11 percent were livestock farms. While cash-grain farms are important in the most parts of the county the greatest concentration of this type is in the northern and eastern portions, while livestock farms are most important in the southwest. Forty percent of the farms were operated by part-owners; 38 percent by tenants; and 22 percent by full-owners.

Land use planning groups in Ward County have begun to approach their adjustment problems. One of the approaches involves preparation of income estimates for the common sizes and types of farms in the county. One group of farmers prepared income estimates for a 320-acre cash-grain farm. This income appeared too small to support a farm family and therefore income estimates were developed for a farm of 480 acres. However, since 44 percent of the farms in the county have 400 acres or less, the county land use planning committee faces a difficult problem in providing 480 acres for every farmer. Future efforts of planning committees in the counties may be focused on adjustments that increase the income without increasing the size of farm.

FARMERS FACE FARM-MANAGEMENT FACTS IN WARD COUNTY, NORTH DAKOTA

by Lloyd E. Jones, Junior Agricultural Economist and
Olav Rogeness, Junior Agricultural Economist
Bureau of Agricultural Economics

AGRICULTURAL HISTORY AND LOCATION OF THE COUNTY

Location

Ward County is located in the northwestern part of North Dakota (fig. 1). Its western boundary is approximately 100 miles east of the Montana line. Its southern boundary is about 80 miles due north of Bismarck, the State capital.

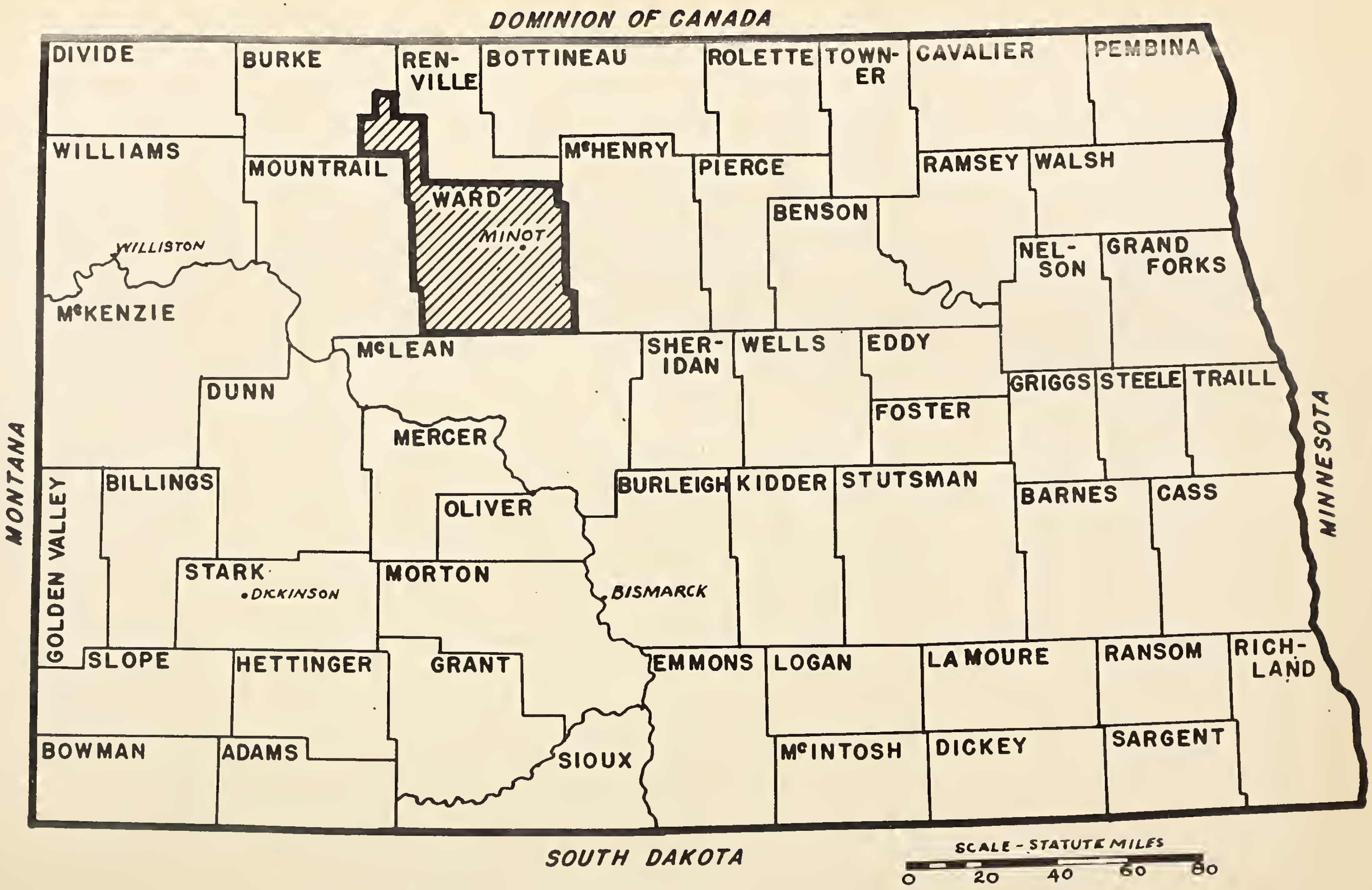
Settlers Rushed Ward County between 1890 and 1910

Rapidity of settlement during the period 1890 to 1910 is indicated in the census figures. In 1890, the census reported only 228 farms with 50,761 acres of land in farms in Ward County, which up to 1910 included all of the present counties of Renville, Burke, and a portion of Mountrail. In 1900 the number of farms had increased to 1,670, a gain of 1,442 farms, or 632 percent over and above the previous decade. The acres of all land in farms had increased to 330,847, a gain of 552 percent over the 1890 Census. During the period from 1900 to 1910, there was an increase of 1,141 farms, representing an increase of 68 percent, despite the fact that during this time the entire counties of Renville and Burke, and a part of Mountrail were carved out of an old Ward County. All land in farms increased 585,434 acres, representing an increase of 177 percent. (See table 11.)

The rapidity with which this county developed into a major wheat-producing locality is again reflected in the census figures. In 1890, there were 2,582 acres of wheat; in 1900, there were 5,181 acres, representing a gain of 2,599 acres, or 100 percent over the preceding census; and in 1910, despite the great reduction in the size of the county, wheat acreage jumped to 259,047, a gain of 253,866 acres.

Growth in population of the county was very rapid between the

LOCATION OF WARD COUNTY, NORTH DAKOTA



NEG. 38832 BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 1

years 1890 and 1910, as shown by the United States Census. In 1890, the population of Ward County was 1,681. During the next decade the population increased to 7,961, a gain of 374 percent over the preceding census. The decade beginning with 1900 saw the greatest increase in population within the history of Ward County. By 1910, the population of Ward County had reached a total 25,281, representing a gain of 17,320 people, and an increase of 218 percent over the census year for the preceding decade. Since 1910, the population has increased steadily, the population in 1920 being 28,811 and in 1930, 33,597.

Farms Become Larger

Land devoted to farms increased very rapidly from 1890 to 1910 (fig. 2). In 1890, there were 50,761 acres of land in farms. In 1900 the acres of all land in farms stood at 330,847, representing an increase of 280,086 acres over the preceding decade. This figure has increased steadily since 1910 and reached its highest figure in 1935, there being 1,159,745 acres of land in farms on that date.

During the early periods of settlement, farms from 100 to 174 acres, were by far the most important size. In 1900, 83 percent of all farms were within this size group (table 10). Since 1900, the proportion of these farms to all farms has steadily decreased, suffering the greatest set back from 1900 to 1910 when the percentage of such farms dropped from 83 to 32. The size group of 260 to 499 acres, consisting of half and three-quarter section farms, became the most important group in 1910, and has maintained that rank ever since. Farms of 1,000 acres and over and of 99 acres and less have both increased in numbers and percentage. The average size of farms has increased steadily, increasing from 326 acres in 1910 to 417 acres in 1935.

The Peak in Farm Numbers was in 1910. In 1890, there were only 228 farms averaging 223 acres in size (fig. 2). In 1900 the total number of farms had jumped to 1,670 which represented an increase of 1,442 farms. In 1910, the number of farms in the county increased to 2,811, the highest ever recorded in a census enumeration for Ward County.

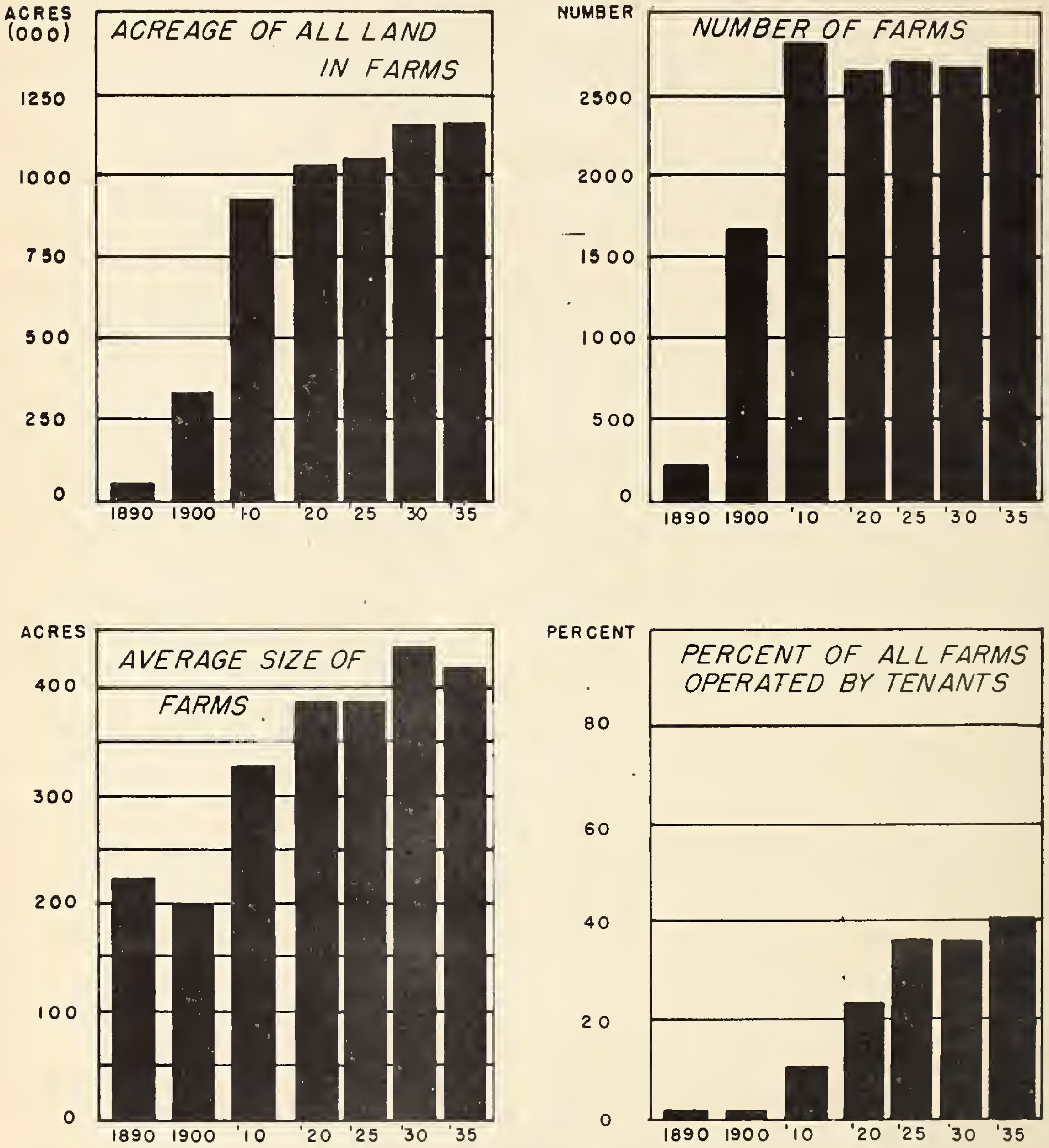
Tenancy Increases

In 1890 and 1900, there were only a few tenant-operated farms in Ward County (fig. 2). This small amount of tenancy is due to the fact that during this period almost all of the farm operators

ACREAGE OF ALL LAND IN FARMS, NUMBER OF FARMS, PERCENT OF TENANCY AND THE AVERAGE SIZE OF FARMS

BY CENSUS YEARS 1890-1935*

WARD COUNTY, NORTH DAKOTA



*IN 1890 AND 1900 WARD COUNTY INCLUDED BURKE AND RENVILLE AND PART OF MOUNTRAIL CO.

SOURCE: ALL DATA FROM U.S. AGRICULTURAL CENSUS EXCEPT "ALL LAND IN FARMS" FOR 1939 WHICH IS FURNISH BY THE AGRICULTURAL MARKETING SERVICE.

NEG. 38833 BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 2

obtained their farms through the Homestead Act. Since 1900, the percentage of tenant-operators has steadily increased. In 1900, only 1 percent of the farms were operated by tenants; in 1935, 41 percent were operated by tenants.

Wheat is Major Crop

Wheat is and has always been the most important crop in the county. The census figures of 1890 and 1900 indicate that only a very small acreage of crops was grown in this area. But the increase in wheat acreage during the first decade of the century was phenomenal, increasing from 5,181 acres in 1900 to 259,047 acres in 1910 (fig. 3).

Total acreages of wheat declined sharply in 1935 after a steady increase since the time of the first settlement. An all-time high of 381,106 acres was reached in 1930. In 1935, only 217,000 acres of wheat were harvested in the county, the lowest acreage of wheat harvested since 1900. Wheat acreage in 1939 was 61,000 acres greater than in 1935.

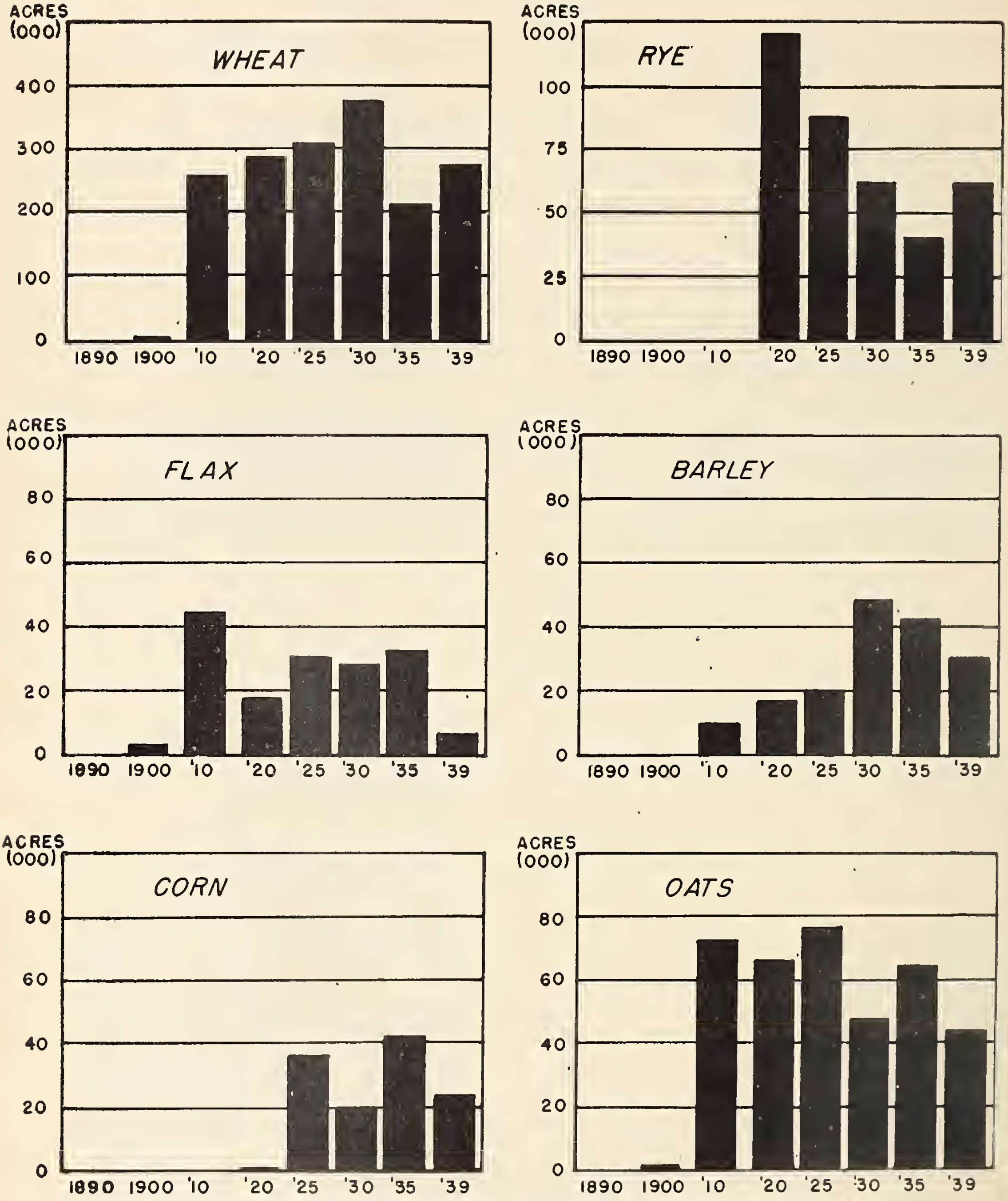
Acreages devoted to rye in the first years of settlement were very insignificant; and as late as 1910, only 314 acres of rye were reported in the county (fig. 3). The increase during the next decade was tremendous, for 119,421 acres of rye were reported in 1920. This was largely in response to the export demand arising from the World War. Acreages of rye have decreased steadily since 1920, reaching 41,000 acres in 1935, but figures for 1939 show an increase of 22,000 acres over 1935. This increase has resulted in part from the increased use of rye as pasture and as a cover-crop.

The acreages of flax in 1890 and 1900 were small, but flax acreages jumped from 2,544 acres in 1900 to 44,922 acres in 1910--the largest acreage ever devoted to flax in Ward County (fig. 3). In 1920, it was reduced to 18,005 acres. From 1920 to 1935, the trend in flax acreages was upward but then there was a serious set back during the period of 1935-39, when the acreage decreased from 33,000 to 7,000 acres. This was partly a result of the unfavorable growing conditions brought about by drought. Flax requires a more thorough preparation of the seed bed and involves somewhat more risk than other crops; therefore, farmers have turned to crops involving less labor and risk.

In 1890 and 1900 acreages of land devoted to barley were insignificant, for only 26 acres of barley were raised in Ward County in 1890, and 445 acres in 1900 (fig. 3). But during the period of 1910-30, barley acreages climbed rapidly, reaching an all-time record high of 48,898 acres in 1930. Since 1930, barley acreages have steadily declined, reaching 31,000 acres in 1939.

Very little corn was raised in Ward County before 1925, and

TRENDS IN ACREAGES OF PRINCIPAL CROPS
—1890*-1900*-1910-1920-1925-1930-1935-1939
WARD COUNTY, NORTH DAKOTA



*IN 1890 WARD COUNTY INCLUDED BURKE AND RENVILLE AND PART OF MOUNTRAIL CO.

SOURCE: ALL DATA FROM U.S. AGRICULTURAL CENSUS EXCEPT 1935 AND 1939 DATA WHICH IS FROM AGRICULTURAL MARKETING SERVICE.
ALL DATA BASED ON HARVESTED ACREAGE EXCEPT 1939 DATA WHICH REPRESENTS SEEDED ACREAGE.

NEG. 38834 BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 3

since 1925, the acreage of corn has been very irregular. Nevertheless corn has become one of the county's important crops.

Oats was one of the most important crops in the early years, ranking second to wheat for 1900 and 1910. The acreage of oats jumped from 3,053 acres in 1900 to 73,615 acres in 1910. The acreage remained about the same for the years 1910, 1920, and 1925, reaching a high of 77,561 acres in 1925. Acreages of land devoted to oats have since declined, and in 1939 amounted to 45,000 acres, the lowest acreage since 1900.

Cattle Most Numerous of Livestock

Fluctuations in cattle numbers since 1920 have been less than in numbers of any other kind of livestock (fig. 4). The greatest increase in cattle numbers occurred during 1890-1900. Cattle increased from 3,105 head in 1890 to 29,150 head in 1900. Cattle numbers decreased materially in the period 1900-10, decreasing to 17,862 head in 1910. The trend in cattle numbers was rapidly upward from 1910 to 1930, when cattle numbers reached 39,119 head, the highest ever enumerated. Since 1930, the trend has been downward, with a sharp break recorded in 1935. Cattle have always been the most numerous of all livestock, except in 1910 when horse numbers exceeded cattle by 2,096 head.

Hog numbers increased rapidly from 1890 to 1925, reaching the highest point in 1925. Since 1925, the trend in hog numbers has been decidedly downward.

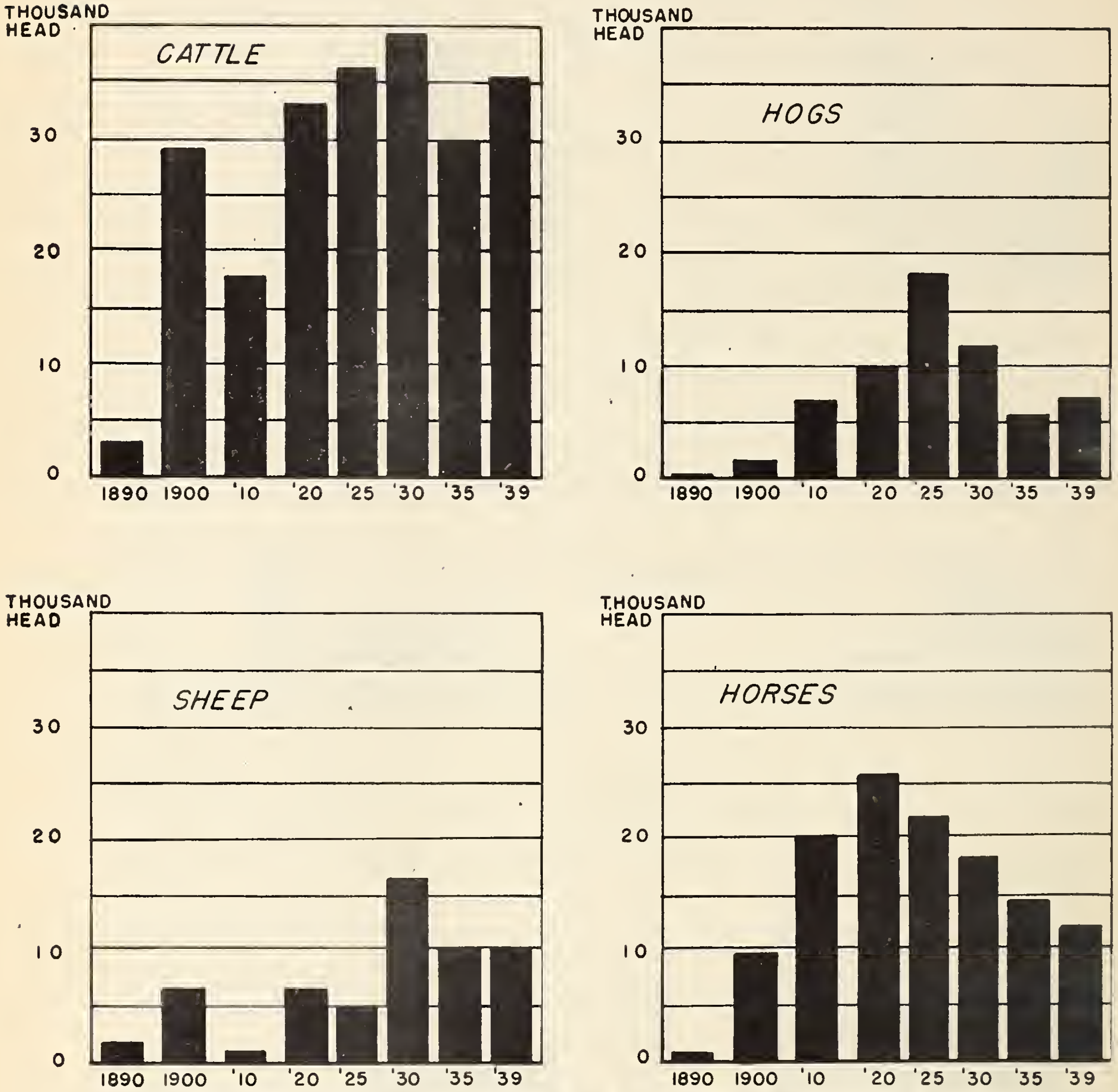
Next to cattle, sheep were the most numerous livestock found in Ward County in the early years of settlement. In 1910, the lowest point was reached in numbers of sheep. In 1920, sheep numbers increased to 6,318 head, representing a gain of 5,214 head over the previous census period. From 1920 to 1930, the trend in total number of sheep was upward. A high point for the entire period from 1890 to 1939 was reached in 1930 when there were 16,624 head. Since 1930, the trend in sheep production has been downward.

The trend in horse numbers was upward in the period 1890-1920. Horses increased from the 718 head in 1890 to 25,439 head in 1920. Since 1920, the number of horses has steadily decreased owing to the increased use of the tractor.

Rainfall Decrease

The annual precipitation for the county has varied considerably since 1892, ranging from a low point in 1934 of only 7.13 inches to a high point of 24.27 inches for the year 1899 (fig. 5). The average precipitation for the entire period has been 15.33 inches. The total amount of precipitation per year has tended to become lower.

TRENDS IN LIVESTOCK NUMBERS
1890*- 1900*-1910-1920-1925-1930-1935-1939
WARD COUNTY, NORTH DAKOTA



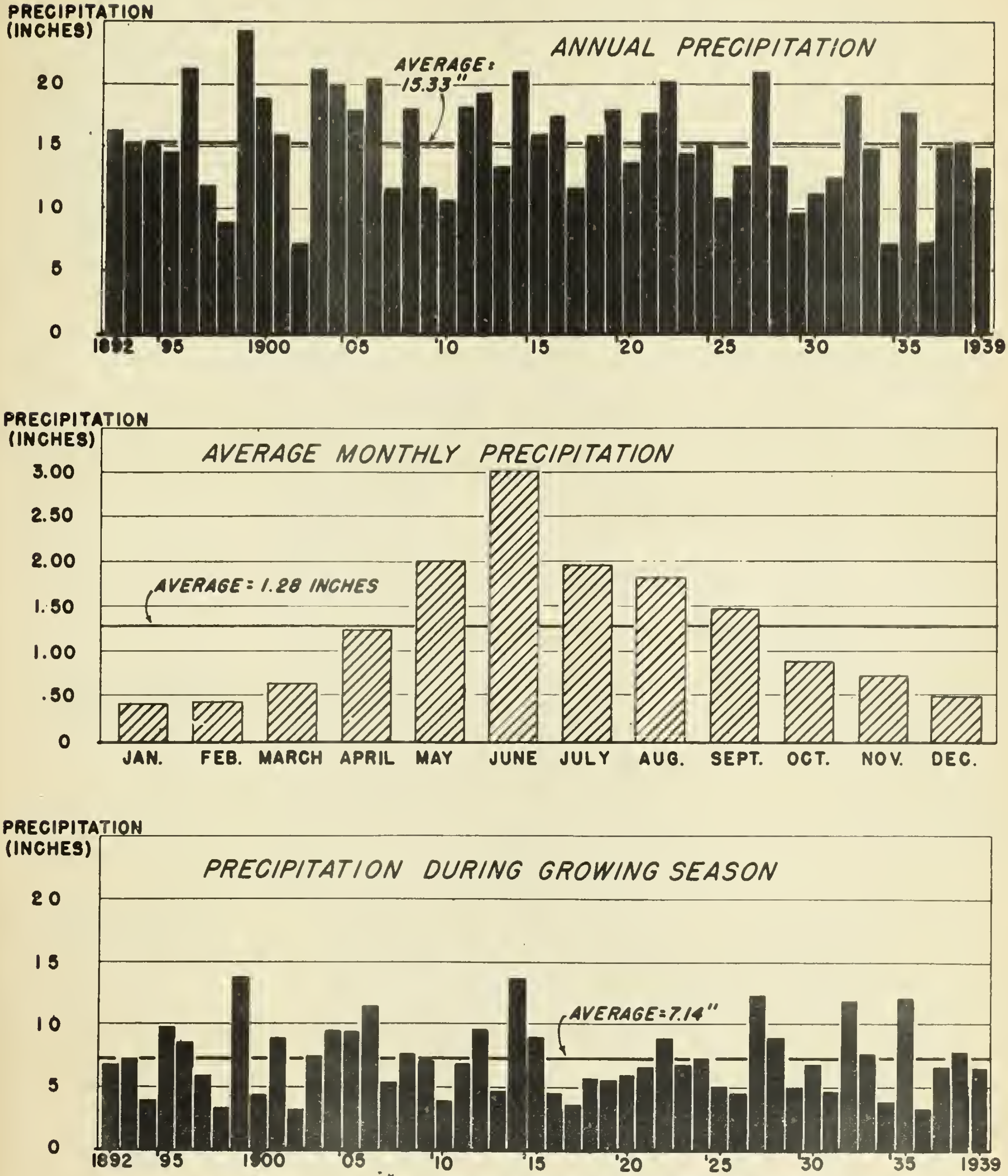
* IN 1890 AND 1900 WARD COUNTY INCLUDED BURKE AND RENVILLE AND PART OF MOUNTRAIL CO.

SOURCE: ALL DATA FROM U.S. AGRICULTURAL CENSUS EXCEPT DATA FOR 1935 AND 1939 WHICH IS FROM AGRICULTURAL MARKETING SERVICE.
LIVESTOCK ENUMERATED JUNE 1, IN 1890, JAN. 1, 1920, 1925 AND 1935, APRIL 1, IN 1910 AND 1930.

NEG. 38835 BUREAU OF AGRICULTURAL ECONOMICS

FIGURE 4

ANNUAL AND AVERAGE MONTHLY PRECIPITATION AND PRECIPITATION DURING THE GROWING SEASON*
1892 TO 1939
WARD COUNTY, NORTH DAKOTA



* THE MONTHS OF MAY, JUNE AND JULY CONSIDERED AS GROWING SEASON

SOURCE: U.S. WEATHER BUREAU RECORDS.
-READINGS FOR 1892 AND 1897 TO 1939 TAKEN AT MINOT.
-READINGS FOR 1893 TO 1896 TAKEN AT GARRISON.

BUREAU OF AGRICULTURAL ECONOMICS.

FIGURE 5

During the period 1911-20, the average precipitation was 16.47 inches; during the period 1921-30, 14.72 inches were recorded; and during 1931-39, the average precipitation decreased to 13.62 inches. During the period 1911-20, there were only 3 years when the annual precipitation was below the 1892-1939 average of 15.33 inches. During the period 1921-30, there were 7 years in which the annual precipitation was below the 1892-1939 average, while in the 9 years succeeding 1930, there have been 7 years in which the rainfall was below average.

Average monthly precipitation is shown in figure 5. The monthly precipitation is highest during the spring and summer months. The largest amount of precipitation, slightly over 3 inches, falls in the month of June. May and July, each with about 2 inches, rank next in monthly precipitation. Starting with January, the precipitation increases each month until June, then gradually declines for the remainder of the year. The average monthly precipitation is 1.28 inches.

Precipitation during the growing season of May, June, and July also varied greatly. Since 1892, the precipitation during the growing season has averaged 7.14 inches. The largest amount of precipitation, 13.68 inches, was in 1914, and the lowest amount, 3.22 inches, was in 1902.

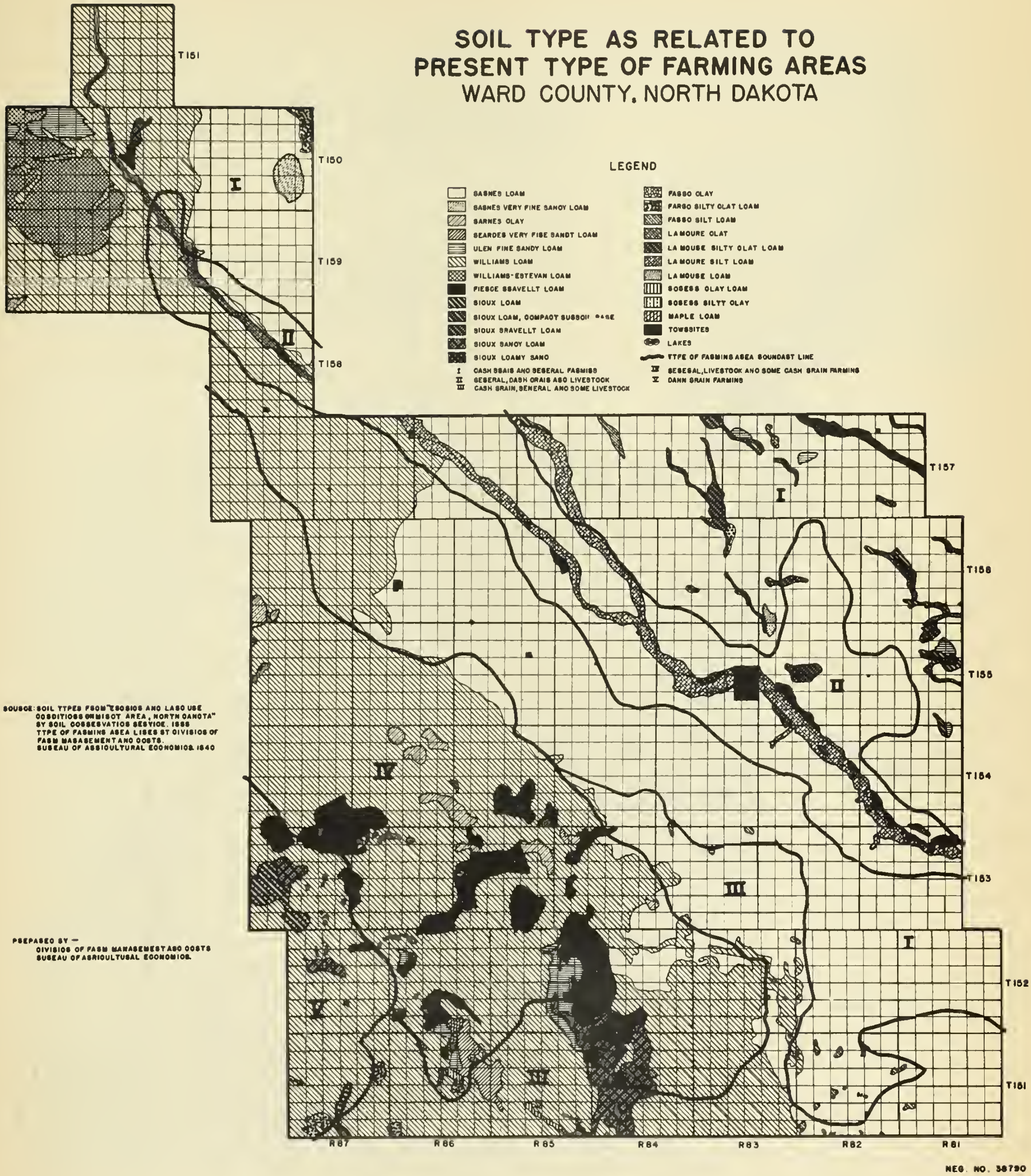
THE PRESENT SITUATION

Soils, Topography and Land Use

Soil and topography are the most important of the physical factors underlying economic problems in Ward County. These factors are shown in a map of soil types (fig. 6), and a map of slope classes (fig. 7). Type-of-farming area lines, described later in this report, have been delineated on both maps. The greater share of the rough or rolling land is located in the southwest part of the county and in the area adjacent to the Souris (Mouse) River (fig. 7). The remainder of the county is level to gently rolling. Of the area, 52 percent has a slope of from 0 to 3 percent; 24 percent has a slope of from 3 to 10 percent; 13 percent has a slope of from 10 to 12 percent; and the remaining 11 percent has a slope of over 12 percent.

Roughly, the soil in the northeastern half of the county is almost entirely Barnes loam. Soil in the southwest half is Williams loam with scattered tracts of the Pierce and Sioux soil series. Soil in the bottom land adjacent to the Souris (Mouse) River is mostly Lamoure silt loam.

Uncultivated land and cropland in Ward County are shown in



SOIL TYPE AS RELATED TO PRESENT TYPE OF FARMING AREAS
WARD COUNTY, NORTH DAKOTA

SOURCE: SOIL TYPES FROM "EROSION AND LAND USE CONDITIONS IN MINOT AREA, NORTH DAKOTA" BY SOIL CONSERVATION SERVICE, [illegible]
TYPE OF FARMING AREA LINES BY DIVISION OF FARM MANAGEMENT AND COSTS.
BUREAU OF AGRICULTURAL ECONOMICS 1940

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DIVISION OF FARM MANAGEMENT AND COSTS
BUREAU OF AGRICULTURAL ECONOMICS.

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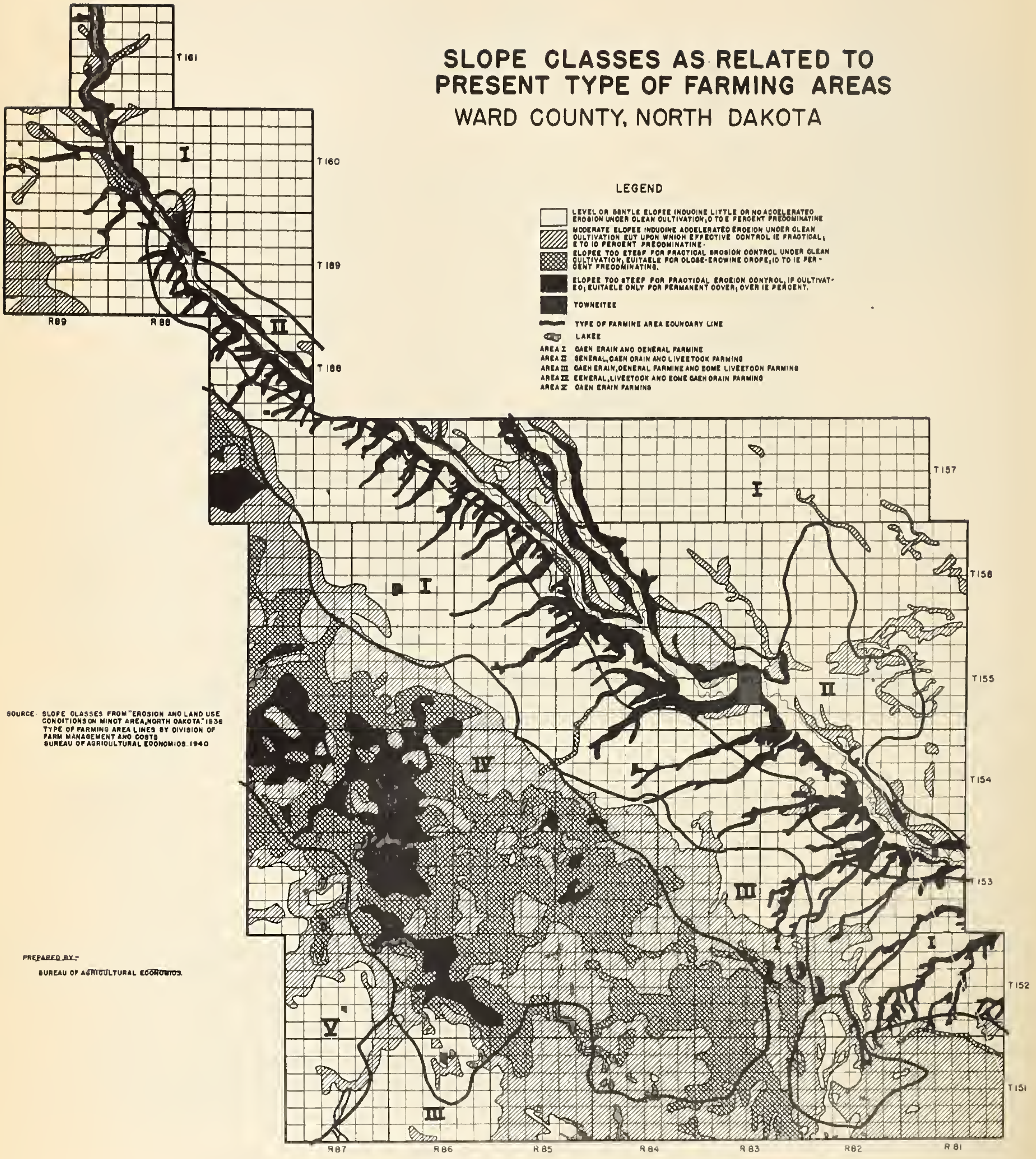
FIGURE 6


SLOPE CLASSES AS RELATED TO PRESENT TYPE OF FARMING AREAS
WARD COUNTY, NORTH DAKOTA
LEGEND
LEVEL OR GENTLE SLOPES INDUCING LITTLE OR NO ACCELERATED EROSION UNDER CLEAN CULTIVATION, 0 TO 5 PERCENT PREDOMINATING
MODERATE SLOPES INDUCING ACCELERATED EROSION UNDER CLEAN CULTIVATION BUT UPON WHICH EFFECTIVE CONTROL IS PRACTICAL, 5 TO 10 PERCENT PREDOMINATING.
SLOPES TOO STEEP FOR PRACTICAL EROSION CONTROL UNDER CLEAN CULTIVATION, SUITABLE FOR CLOSE-GROWING CROPS, 10 TO 15 PERCENT PREDOMINATING.
SLOPES TOO STEEP FOR PRACTICAL EROSION CONTROL, IF CULTIVATED; SUITABLE ONLY FOR PERMANENT COVER, OVER 15 PERCENT.
TOWNSITES
TYPE OF FARMING AREA BOUNDARY LINE
LAKES
AREA I CASH GRAIN AND GENERAL FARMING
AREA II GENERAL, CASH GRAIN AND LIVESTOCK FARMING
AREA III CASH GRAIN, GENERAL FARMING AND SOME LIVESTOCK FARMING
AREA IV GENERAL, LIVESTOCK AND SOME CASH GRAIN FARMING
AREA V CASH GRAIN FARMING
T 161
T 160
T 159
T 158
T 157
T 156
T 155
T 154
T 153
T 152
T 151
R 89
R 88
R 87
R 86
R 85
R 84
R 83
R 82
R 81
I
II
I
I
II
IV
III
I
V
III

SOURCE: SLOPE CLASSES FROM "EROSION AND LAND USE CONDITIONS ON MINOT AREA, NORTH DAKOTA." 1939
TYPE OF FARMING AREA LINES BY DIVISION OF FARM MANAGEMENT AND COSTS
BUREAU OF AGRICULTURAL ECONOMICS 1940

PREPARED BY -
BUREAU OF AGRICULTURAL ECONOMICS.

NEG NO 38769

FIGURE 7

figure 8. Most of the uncultivated land lies along the rough area adjacent to the Souris (Mouse) River and in the southwestern and central part of the county. There the land is chiefly devoted to livestock farming.

Cash crops are important in the extreme southwest corner of the county and in the remainder of the county outside of Area IV. As a rule, going from the southwest to the northeast, the proportion of land in pasture decreases. Going from east to west, the proportion of idle cropland increases, being extremely high in the townships forming the gooseneck in the northwest part of the county (fig. 9).

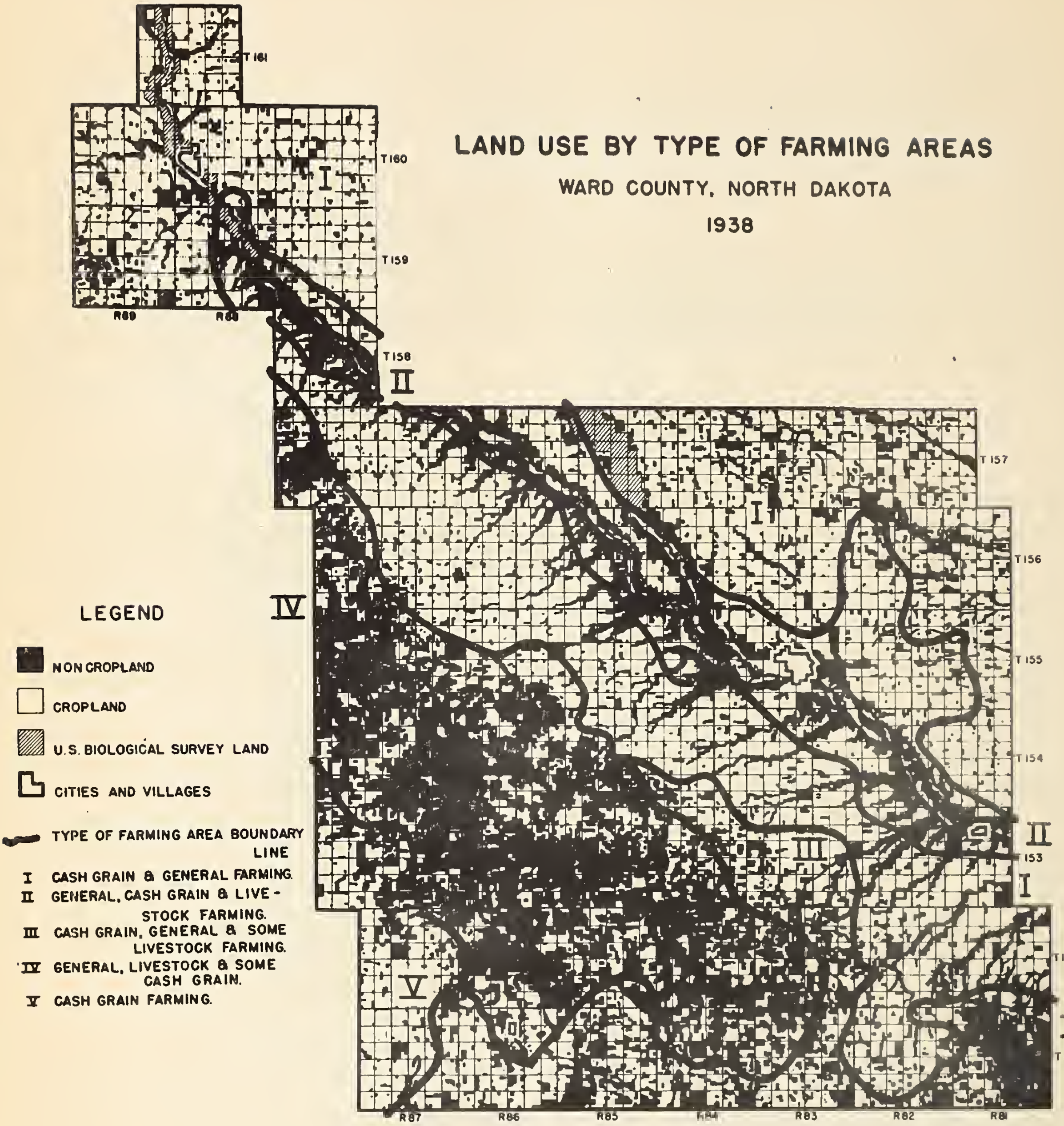
Tenants Operate 38 Percent of Farms

There are 2,135 farms in Ward County; of these, 20 percent are quarter sections, 24 percent are half sections, 21 percent are three-quarter sections, 12 percent are section farms, 9 percent are a section and a quarter, and the remaining 14 percent are more than 880 acres in size (table 2).

Distribution of farm sizes by type-of-farming areas is shown in tables 3, 4, 5, 6, and 7. The geography of the size distribution is shown in figure 10.

Tenants operate 815 farms, or 38 percent, of the 2,135 farms in Ward County; part-owners operate 859 farms or 40 percent of the total, and 461 farms or 22 percent, are owner-operated (table 1).

Table 1 reveals that the part-time farms include the highest percentage of owner-operated farms. The smallest amount of tenancy is found among the ranches, for only 30 percent of the ranches are tenant-operated. The lowest percentage of owner-operated farms is found within the cash-grain units. Only 171 cash-grain farms or 16 percent of this type are owner-operated.



LAND USE BY TYPE OF FARMING AREAS
WARD COUNTY, NORTH DAKOTA
1938

LEGEND
▇ NONCROPLAND
☐ CROPLAND
▨ U.S. BIOLOGICAL SURVEY LAND
CITIES AND VILLAGES
TYPE OF FARMING AREA BOUNDARY LINE
I CASH GRAIN & GENERAL FARMING.
II GENERAL, CASH GRAIN & LIVESTOCK FARMING.
III CASH GRAIN, GENERAL & SOME LIVESTOCK FARMING.
IV GENERAL, LIVESTOCK & SOME CASH GRAIN.
V CASH GRAIN FARMING.
I
II
III
IV
V
T 161
T 160
T 159
T 158
T 157
T 156
T 155
T 154
T 153
T 152
T 151
R 89
R 88
R 87
R 86
R 85
R 84
R 83
R 82
R 81

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NORTH DAKOTA EXTENSION SERVICE AND
THE BUREAU OF AGRICULTURAL ECONOMICS
U.S. DEPARTMENT OF AGRICULTURE
AUGUST 1939

SOURCE:
AERIAL PHOTOGRAPHS BASE FOR
WARD COUNTY AGRICULTURAL CONSERVATION ASSOCIATION
AGRICULTURAL ADJUSTMENT ADMINISTRATION
U.S. DEPARTMENT OF AGRICULTURE

FIGURE 8

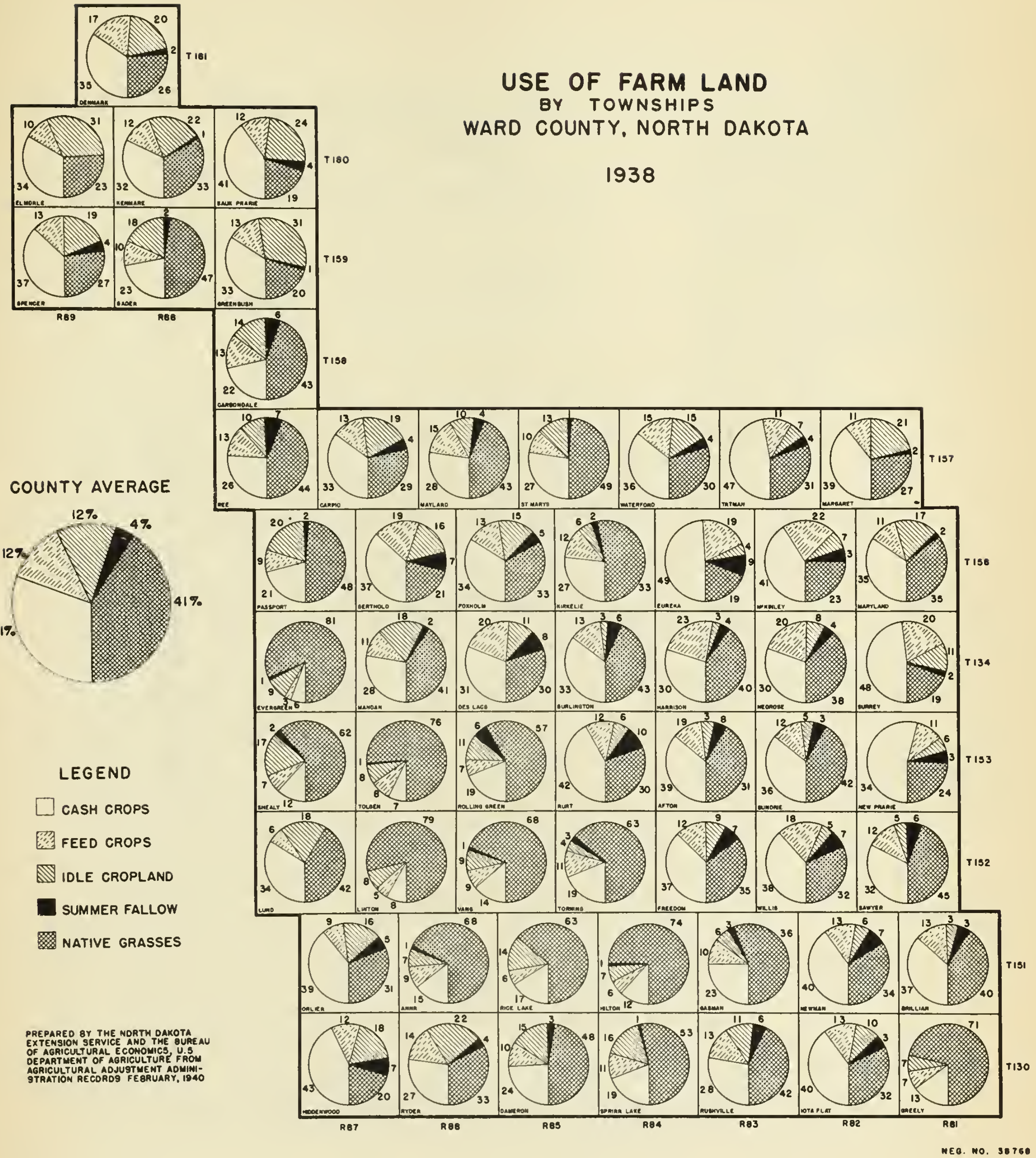

USE OF FARM LAND
BY TOWNSHIPS
WARD COUNTY, NORTH DAKOTA
1938
COUNTY AVERAGE
12%
4%
12%
41%
31%
LEGEND
CASH CROPS
FEED CROPS
IDLE CROPLAND
SUMMER FALLOW
NATIVE GRASSES
PREPARED BY THE NORTH DAKOTA EXTENSION SERVICE AND THE BUREAU OF AGRICULTURAL ECONOMICS, U.S. DEPARTMENT OF AGRICULTURE FROM AGRICULTURAL ADJUSTMENT ADMINISTRATION RECORDS FEBRUARY, 1940
T161
T160
T159
T158
T157
T156
T154
T153
T152
T151
T150
R89
R88
R87
R86
R85
R84
R83
R82
R81
DENMARK
ELMORLE
KENMARE
SAUK PRAIRIE
SPENCER
BADEN
GREENBUSH
CARBONDALE
REE
CARPIO
MAYLAND
ST MARYS
WATERFORD
TATMAN
MARGARET
PASSPORT
BERTHOLD
FOXHOLM
KIRKELIE
EUREKA
MCKINLEY
MARYLAND
EVERGREEN
MANDAN
DES LACS
BURLINGTON
HARRISON
NEDROSE
SURREY
SHEALY
TOLGEN
ROLLING GREEN
HURT
AFTON
SUNDRE
NEW PRAIRIE
LUND
LINTON
VANG
TORNING
FREEDOM
WILLIS
SAWYER
ORLIEN
ANNA
RICE LAKE
HILTON
GASMAN
NEWMAN
BRILLIAN
HIDDENWOOD
RYDER
CAMERON
SPRING LAKE
RUSHVILLE
IOTA FLAT
GREELY
NEG. NO. 38768

FIGURE 9

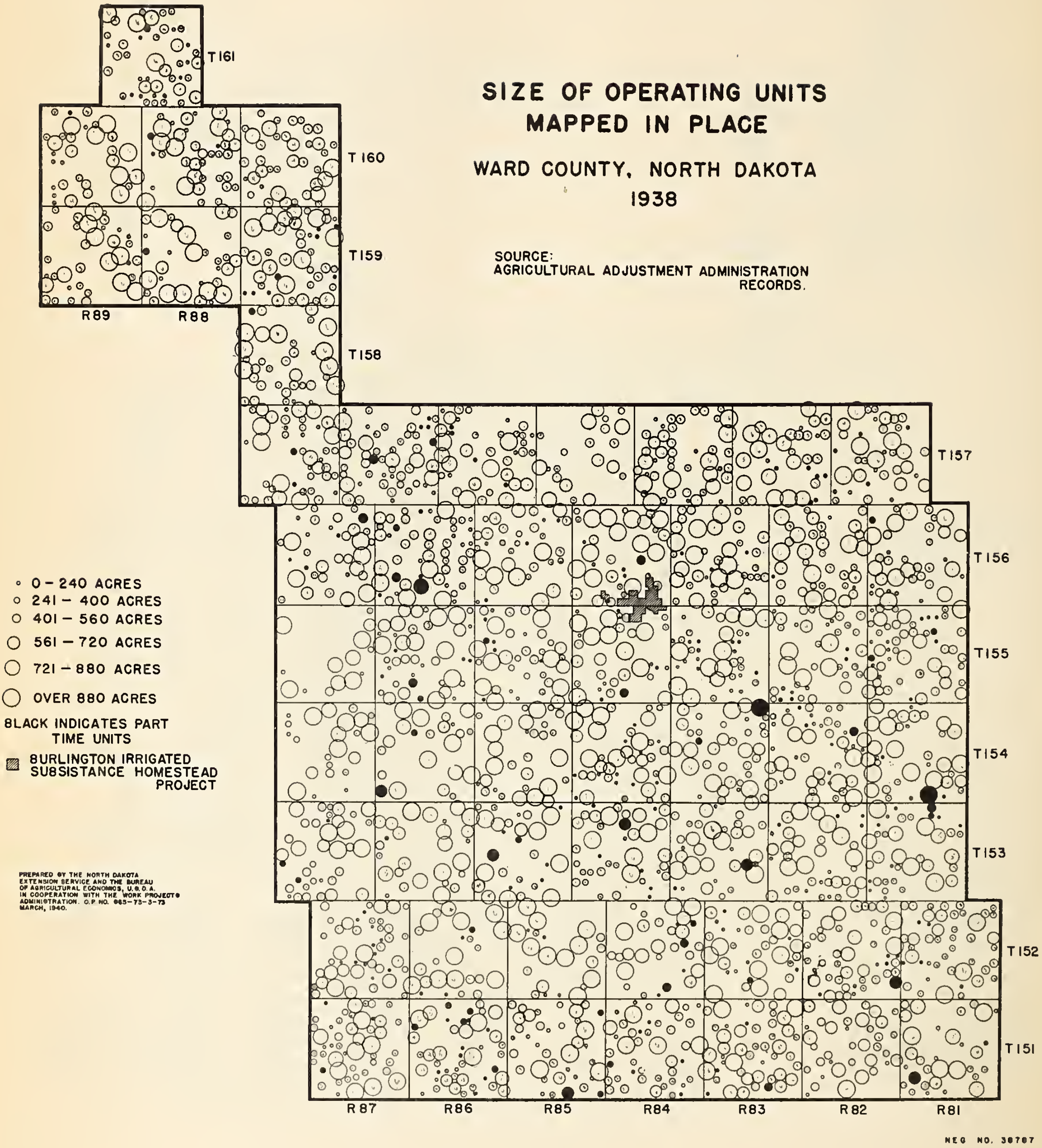

SIZE OF OPERATING UNITS
MAPPED IN PLACE
WARD COUNTY, NORTH DAKOTA
1938
SOURCE:
AGRICULTURAL ADJUSTMENT ADMINISTRATION RECORDS.
0 - 240 ACRES
241 - 400 ACRES
401 - 560 ACRES
561 - 720 ACRES
721 - 880 ACRES
OVER 880 ACRES
BLACK INDICATES PART TIME UNITS
▨ BURLINGTON IRRIGATED SUBSISTANCE HOMESTEAD PROJECT
T161
T160
T159
T158
T157
T156
T155
T154
T153
T152
T151
R89
R88
R87
R86
R85
R84
R83
R82
R81
PREPARED BY THE NORTH DAKOTA EXTENSION SERVICE AND THE BUREAU OF AGRICULTURAL ECONOMICS, U.S.D.A. IN COOPERATION WITH THE WORK PROJECTS ADMINISTRATION. O.P. NO. 665-73-3-73 MARCH, 1940.
NEG NO. 38787

FIGURE 10

Table 1. - Type of farms by tenure, Ward County, No. Dak., 1938

Type of Farm	Owner		Part Owner		Tenant		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Cash Grain	171	16	485	45	422	39	1,078	100
General	131	22	234	40	225	38	590	100
Livestock	45	19	102	43	92	38	239	100
Self Sufficing	14	37	9	24	15	39	38	100
Ranch			14	70	6	30	20	100
Cash Specialty			2	100			2	100
Part-time	100	59	13	8	55	33	168	100
Total	461	22	859	40	815	38	2,135	100

Compiled from Agricultural Adjustment Administration records.

TYPE-OF-FARMING AREAS OF THE COUNTY

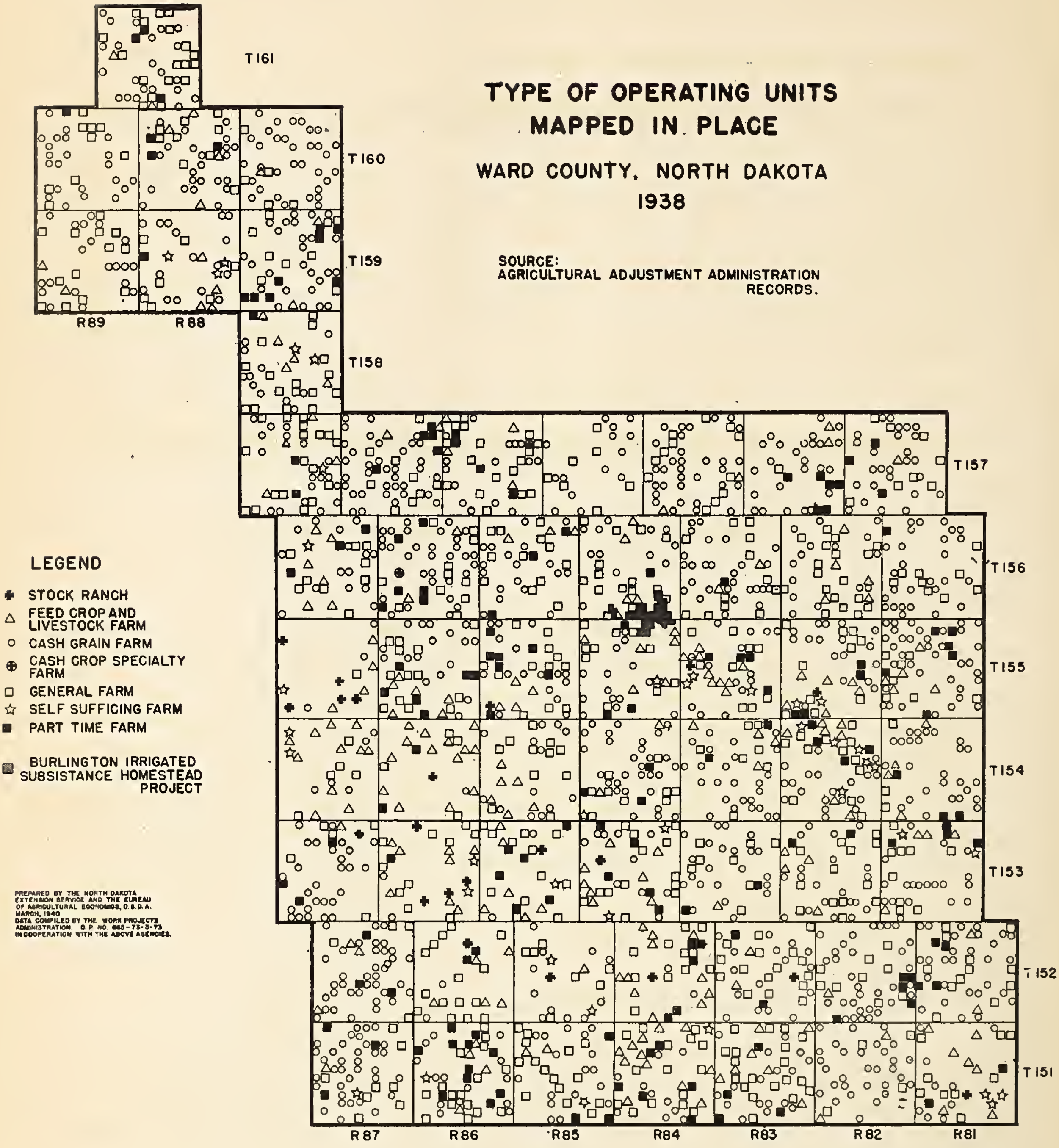
Delineation of Type Areas

In order that certain aspects of the economic and some of the physical problems could be localized into smaller areas and then specifically described, all of the farms in the county were classified by types of farming practiced. (See page 57.) Geography of type for each farm is shown in figure 11. Examination of this map made it possible to develop figure 12, showing five types of farming areas, each area containing farms of reasonable similarity in type. There are 2,135 farms in the county; 50 percent of the total farms are cash-grain, 28 percent are general, 11 percent are livestock, 8 percent are part-time, 2 percent are self-sufficing farms, and the remaining 1 percent are stock ranches (table 2).

Area I. Cash-Grain and General Farming

Area I contains 582,666 acres, or 44 percent of the total land in the county, and is the largest type-of-farming area. Here the farms contain a larger proportion of land in crops than is true of the farms in the other areas. Area I contains 1,008 farms averaging 544 acres in size, each averaging 407 acres, or 75 percent in crops and 137 acres, or 25 percent in pasture. It lies in the northern and eastern portions of the county and is partially bisected by Area II (fig. 12).

The topography is mostly level to gently rolling, ranging from 0 to 3 percent in slope. (See fig. 7.)



TYPE OF OPERATING UNITS
MAPPED IN PLACE

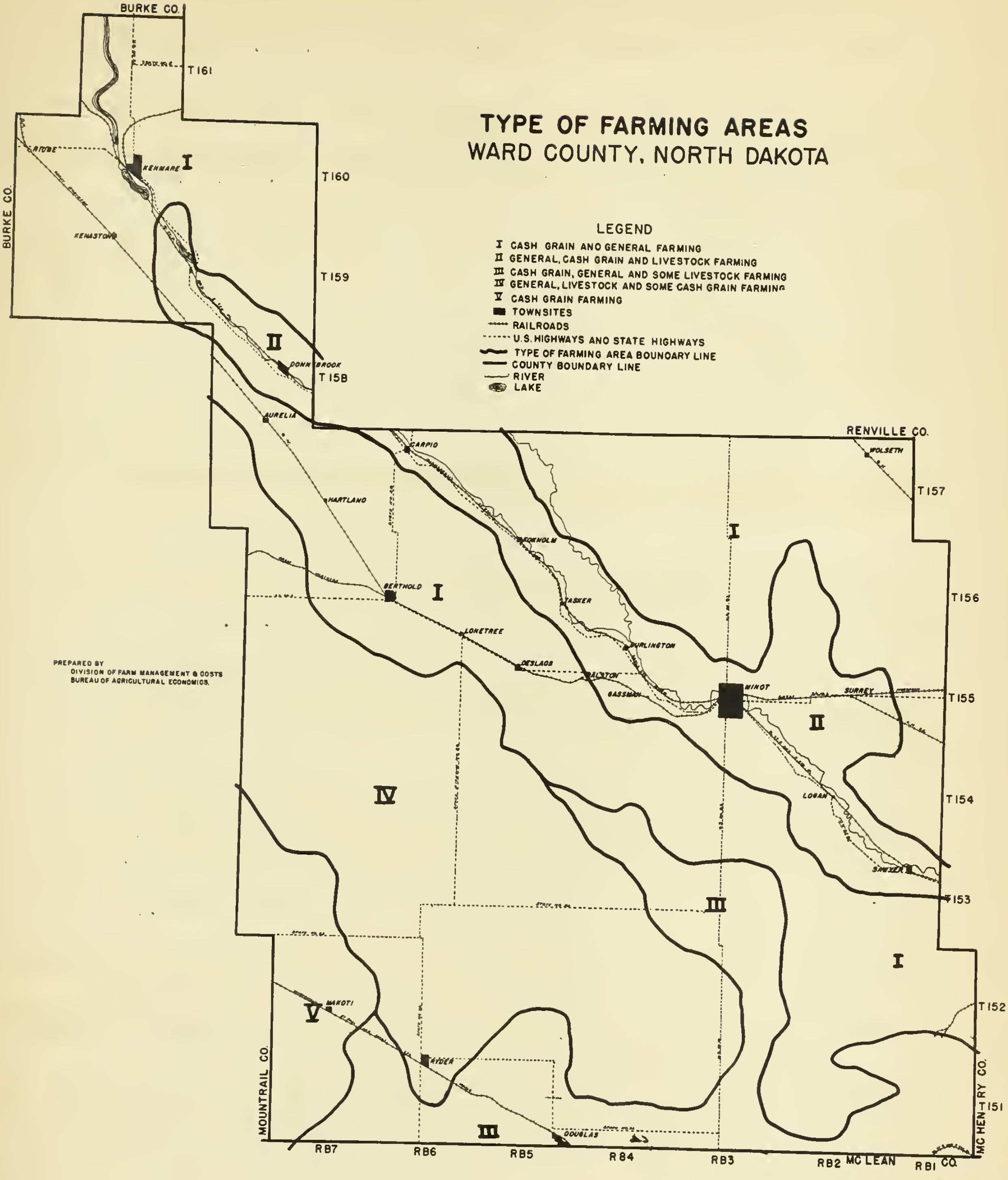
WARD COUNTY, NORTH DAKOTA
1938

SOURCE:
AGRICULTURAL ADJUSTMENT ADMINISTRATION
RECORDS.

PREPARED BY THE NORTH DAKOTA
EXTENSION SERVICE AND THE BUREAU
OF AGRICULTURAL ECONOMICS, U.S.D.A.
MARCH, 1940
DATA COMPILED BY THE WORK PROJECTS
ADMINISTRATION. O.P. NO. 665-73-3-73
IN COOPERATION WITH THE ABOVE AGENCIES.

NEG. NO. 38766

FIGURE 11



NEG. NO 38789

FIGURE 12

Table 2. - Type of farms by size, Ward County, No. Dak., 1938

Type	0-240		241-400		401-560		561-720		721-880		881-over		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Cash-Grain	137	13	243	22	258	24	158	15	120	11	162	15	1,078	100
General	95	16	159	27	129	22	72	12	42	7	93	16	590	100
Livestock	51	21	63	26	47	20	33	14	21	9	24	10	239	100
Self-Sufficing	28	74	10	26									38	100
Ranch									4	20	16	80	20	100
Cash-Specialty			1	50	1	50							2	100
Part-time	116	69	31	18	12	7	6	4	1	1	2	1	168	100
Total	427	20	507	24	447	21	269	12	188	9	297	14	2,135	100

Compiled from Agricultural Adjustment Administration records.

The soils are mostly Barnes Loam, but the soils west of Berthold and Carpio and West of Range 87 in the gooseneck are predominately of Williams loam and Williams-Estevan loam. (See fig. 6.)

Of the 1,008 farms in Area I, 222 farms, or 22 percent, are owner-operated; 384 farms, or 38 percent, are operated by part-owners; and the remaining 402 farms, or 40 percent, are tenant-operated. (See table 18.)

The farms are predominantly cash-grain farms; 69 percent are classified as cash-grain farms, 22 percent as general farms, 6 percent as part-time, and 3 percent as livestock farms (table 3).

Table 3. - Type of farms by size, Area I, Ward County, No. Dak., 1938

Type	0-240		241-400		401-560		561-720		721-880		881-over		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Cash-Grain	83	12	144	21	183	26	103	15	76	11	104	15	693	100
General	42	19	80	36	39	17	25	11	16	7	22	10	224	100
Livestock	9	29	9	29	5	15	4	13	2	7	2	7	31	100
Self-Sufficing	2	100											2	100
Cash-Specialty					1	100							1	100
Part-time	42	73	9	16	5	9			1	2			57	100
Total	178	18	242	24	233	23	132	13	95	9	128	13	1,008	100

Compiled from Agricultural Adjustment Administration records.

Eighteen percent of the farms are 240 acres and less; 24 percent have between 241-400 acres; and 23 percent range from 401 to 560 acres (table 3).

Table 20 gives the average farm organization by size for each of the main types of farm classifications in Area I. This table merits especial consideration for it provides important information needed in the development of farm budgets. The table brings out the differences in farm organization among size groups and types of farms.

In the case of the cash-grain units, the proportion of idle land to cropland is greatest on the smaller farms, decreasing from 28 percent on the quarter-section units to 10 percent on the farms above 880 acres. In the case of general farms an opposite trend is noted, for the proportion of idle cropland increases from 12 percent on the quarter-section farms to 30 percent on the farms of 880 acres and over. (See table 25.)

Area II, General, Cash-Grain and Livestock Farming

Area II extends diagonally across the county. It includes the land adjacent to the Souris (Mouse) River, and is bordered on both sides by Area I (fig. 12). It contains a total of 185,852 acres, or 14 percent of the county's area. It includes 327 farms averaging 503 acres each, with 288 acres, or 57 percent of all land in crops, and 215 acres, or 43 percent in pasture.

The topography is very irregular, ranging from level bottomlands and level uplands, with very little slope, to bluffs and deep-cut intermittent streams, with a slope of more than 12 percent. (See fig. 7.) The predominant soil is Barnes loam. Another important upland soil is Williams loam. Soil in the bottomland adjacent to the Souris River is Lamoure silt loam.

Of the 327 farms, 112 farms or 34 percent, are general farms; 90 farms, or 28 percent are cash-grain farms; and 67 farms, or 20 percent are livestock farms. There are only two ranches; the remaining units are either self-sufficing or part-time. The 0-240 acre size group is the largest in the area, with 94 farms, or 29 percent of all farms, in this group. One-fourth, or 83 farms, average between 241 and 400 acres. Sixteen percent are between 401 and 560 acres. Sixty-six farms, or 20 percent, have 721 acres and more (table 4).

The cash-grain farms usually contain a higher acreage of cropland than the other types of farms. This is also reflected in the percentage of land devoted to crops, for cash-grain farms devote from 65 to 77 percent of their land to crops, compared with a range of 50 to 69 percent for the general farms and 35 to 62 percent for the livestock farms. (See table 25.) As would be

Table 4. - Type of farms by size, Area II, Ward County, No. Dak., 1938

Type	0-240		241-400		401-560		561-720		721-880		881-over		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Cash-Grain	10	11	28	31	14	16	13	14	10	11	15	17	90	100
General	19	17	24	21	22	20	16	14	10	9	21	19	112	100
Livestock	22	33	23	34	14	21	2	3	1	1	5	8	67	100
Self-Sufficing	15	83	3	15									18	100
Cash-Specialty			1	100									1	100
Ranch											2	100	2	100
Part-time	28	76	4	11	3	8					2	5	37	100
Total	94	29	83	25	53	16	31	10	21	6	45	14	327	100

Compiled from Agricultural Adjustment Administration records.

expected, the acreages of non-cropland are much higher, ranging from 58 to 1,269 acres, for the livestock farms, compared with a range of 51 to 415 acres for the cash-grain farms and a range of 70 to 588 acres for the general farms. (See table 21.)

This area contains the highest proportion to tenancy in the county, for tenants operate 138 farms, or 42 percent, of the total of 327 farms; 105 farms, or 32 percent, are operated by part owners, and 84 farms, or 26 percent, are owner-operated. (See table 18.)

Area III, Cash-Grain, General, and some Livestock Farming

Area III is in the southern part of the county and represents an irregular shaped transitional area. (See fig. 12.) It includes a total of 167,080 acres, or 13 percent of the acreage of the county. There are 264 farms in this area, each averaging 527 acres in size, each with 321 acres, or 61 percent, of the land, in crops, and with 206 acres, or 39 percent, in pasture.

The topography varies widely from almost level land in some parts to slopes of more than 12 percent in small parts of the area. Most of the land has a slope of from 3 to 10 percent. (See fig. 7.)

Soils in the part lying west of U. S. Highway 83 and South of Area IV are entirely Williams loam; the remainder is Barnes loam. (See fig. 6.) This is a transitional area, connecting Areas I and IV. Cash-grain predominates in Area I, and general and livestock farming systems predominate in Area IV.

There are 264 farms, of which 119 farms, or 45 percent, are cash-grain units; 94 farms, or 36 percent, are general farms; and 25 farms, or 9 percent, are livestock farms (table 4.)

Table 5. - Type of farms by size, Area III, Ward County, No. Dak., 1938

Type	0- 240		241- 400		401- 560		561- 720		721- 880		881- over		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Cash-Grain	14	12	26	22	26	22	24	20	14	12	15	12	119	100
General	18	19	23	24	24	26	16	17	2	2	11	12	94	100
Livestock	7	28	4	16	4	16	6	24	3	12	1	4	25	100
Self-Sufficing	2	33	4	67									6	100
Ranch											2	100	2	100
Part-time	9	50	5	28	1	6	3	16					18	100
Total	50	19	62	23	55	21	49	19	19	7	29	11	264	100

Compiled from Agricultural Adjustment Administration records.

The largest size group is the 241-to-400 acre group which includes 23 percent of all farms within the area. The 401-to-560 acre group is the next largest and contains 55 farms, or 21 percent of all farms. The 0-to-240, and the 561-to-720 acre size group each contains 19 percent of all farms within the area. Eighteen percent of the farms are of 721 acres and more (table 5.)

Among the 264 farms, 118 farms, or 45 percent, are operated by part-time owners; 94 farms, or 36 percent, are tenant-operated; and 52 farms, or 19 percent, are operated by owners. (See table 18.)

The cash-grain farms contain a higher percentage of land in crops than either the general or the livestock and feed-crop farms. The percentage of land in crops in the case of the cash-grain farms ranges from 66 to 74 percent. The percentage of cropland ranges between 56 and 67 percent for the general farms, and from 23 to 55 percent for the livestock farms. (See tables 22 and 25.)

Area IV, General, Livestock, and some Cash-Grain Farming

Area IV is in the southwestern part of the county, and includes a total land area of 320,319 acres, or 24 percent of the county's total land area. The farms contain a higher percentage of land in pasture than the farms of the other areas. There are 421 farms averaging 590 acres in size, with 241 acres, or 41 percent, of the land in crops and with 349 acres, or 59 percent, in pasture.

The topography is quite rolling and rough. Most of the land has a slope of more than 10 percent, and some parts have a slope of 12 percent and over. (People on land like this will probably have to pay considerable attention to soil conservation work). Land having a slope of from 10 to 12 percent is said to be too steep for practical erosion control under clean cultivation, and is suitable only for close-growing crops. Land of more than 12 percent slope is too steep for practical erosion control and suitable only for permanent cover. (See fig. 7.)

The soils are mostly Williams loam, intermingled with considerable Pierce gravelly loam and Sioux sandy loam. (See fig. 6). The report, "Erosion and Related Land Use Conditions On the Minot Area", issued by Soil Conservation Service, says that the most desirable use for this land is pasture, although some of it is plowed.

Area IV has a lower percentage of owner-operated land than any other area in the county, for only 72 farms, or 17 percent, are owner-operated; 201 farms, or 48 percent, are operated by part-owners, while 148 farms, or 35 percent, are tenant-operated. (See table 18.)

Of the 421 farms, 153 farms, or 36 percent, are general farms; 112 farms, or 27 percent, are livestock farms; and 82 farms, or 19 percent, are cash-grain farms. There are 16 ranches, representing 4 percent of the farms. This is the only area in which ranches are important, because there are only 20 ranches in the county. The remainder of the farms in Area IV are part-time or self-sufficing units (table 6).

Table 6. - Type of farms by size, area IV, Ward County, No. Dak., 1938

Type	0-240		241-400		401-560		561-720		721-880		881-over		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Cash-Grain	16	20	21	26	11	13	6	7	10	12	18	22	82	100
General	16	11	28	18	43	28	14	9	14	9	38	25	153	100
Livestock	12	11	26	23	23	21	20	18	15	13	16	14	112	100
Self-Sufficing	9	82	2	18									11	100
Ranch									4	25	12	75	16	100
Part-time	31	66	10	20	3	7	3	7					47	100
Total	84	20	87	21	80	19	43	10	43	10	84	20	421	100

Compiled from Agricultural Adjustment Administration records.

The 0-to-240, the 241-to-400, and the 401-to-560-acre size groups each represent about one-fifth of the farms in Area IV; the 561-to-720, and the 721-to-880-acre size groups each account for 10 percent of the total farms. This area contains the largest proportion of farms that are more than 881 acres in size. Twenty percent of the farms are of 881 acres and more, compared with 13 percent for Area I, 14 percent for Area II, 11 percent for Area III, and 9 percent for Area V.

The ranches are composed almost entirely of pastureland. The amount of cropland varies from 9 to 10 percent. A smaller percentage of cropland is found on the livestock farms than on either the general or the cash-grain farms. The livestock farms have from 29 to 45 percent of cropland, compared with the general farms which have from 43 to 62 percent. The cash grain farms have from 58 to 62 percent in cropland. (See tables 23 and 25.)

Area V, Cash-Grain Farming

Area V is in the extreme southwestern part of the county. It is the smallest type-of-farming area in the county, and has a total area of 58,643 acres, or 5 percent of the total of the county. The farms rank second to Area I in the amount of land devoted to crops. There are 115 farms averaging 509 acres in size, with 371 acres, or 73 percent, of all land in cropland, and 138 acres, or 27 percent, in pasture.

The topography is predominantly level to gently rolling, intermingled with areas sloping from 3 to 10 percent and with small areas sloping from 10 to 12 percent. (See fig. 7.)

The soils are almost exclusively Williams loam, with small areas of the Pierce and Sioux series. (See fig. 6.)

Area V has the highest percentage of owner-operated farms in the county. Of the 115 farms, 31 farms, or 27 percent, are owner-operated. Thirty-three farms, or 29 percent, are tenant operated and the remaining 51 farms, or 44 percent, are operated by part-owners. (See table 18.)

This is almost wholly a cash-grain farming area. Of the total of 115 farms, 94 farms, or 82 percent, are cash-grain farms; 9 farms, or 8 percent, are part-time units; 7 farms, or 6 percent, are classified as general farms. There are only 4 livestock farms (table 7).

Table 7. - Type of farms by size, Area V, Ward County, No. Dak., 1938

Type	0-240		241-400		401-560		561-720		721-880		881-over		Total	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Cash-Grain	14	15	24	25	24	25	12	13	10	11	10	11	94	100
General			4	58	1	14	1	14			1	14	7	100
Livestock	1	25	1	25	1	25	1	25					4	100
Self-Sufficing			1	100									1	100
Part-time	6	67	3	33									9	100
Total	21	18	33	29	26	23	14	12	10	9	11	9	115	100

Compiled from Agricultural Adjustment Administration records.

The 241-to-400-acre size group is the largest, including 33 farms or 29 percent of all farms. The next largest is the 401-to-560 size group, which represents 23 percent of the farms. Eighteen percent of the farms have 240 acres or less.

The cash-grain farms contain a larger proportion of land in crops than any other group of farms in the county. The percentage of cropland for the cash-grain farms ranges from 86 percent for the quarter-section cash-grain farms to 64 percent for farms of 881 acres and more. The amount of land on the cash-grain farms devoted to feed crops is relatively small compared with the cash-grain acreages. (See tables 24 and 25.)

BUDGET APPROACH TO FARM-MANAGEMENT PROBLEMS IN TYPE-OF-FARMING AREA I

And thus a story was written in Ward County -- a story of its past. But the county today through its county land use planning committee faces the necessity of recognizing certain mistakes in this past. Corrections must be made. In other words, our data should be used to separate the good from the bad and define the best ways of maintaining the good and minimizing the bad. With this in mind, the planning group in the Sawyer community, the Ward County Agent and a technical advisor from the Bureau of Agricultural Economics on Farm Management and Costs met to determine the best size and type of farm for Area I. (Area class E-1 in planning report.)

During the first meeting the farmers approached the problem of developing a farm organization for a minimum "economic" unit. As a first step, an organization for a 320-acre cash-grain farm in Area I was developed. Because of the low income of $216, exclusive of that share of the family living which comes from the farm for labor and management, the farmers said the 320-acre cash-grain farm was too small to furnish an adequate living. (See table 17.) In Area I there are 227 farms representing 33 percent of the cash-grain farms (or 22 percent of all farms irrespective of type) that are smaller than 400 acres (table 3).

The members of the group indicated that $216 was about all that the 320-acre cash-grain farms had returned during the past decade (table 8). Such a small return for the 320-acre cash-grain farm indicates the existence of a serious problem. The farm plan recommended by the planning group was very similar to the 320-acre cash-grain units now operating in this county. Therefore, such a recommendation says that 11 percent of all farms in Ward County are too small to furnish an adequate living.

Table 8. - Income and expenses developed from farm budgets, Area I, Ward County, No. Dak.

Item	320-acre cash-grain farm	480-acre cash-grain farm	480-acre general farm
	Dollars	Dollars	Dollars
Gross cash income	1,017	1,170	2,279
Cash expenses	762	657	1,195
Net cash income	255	513	1,084
Non cash expenses 1/	219	263	251
Labor income 2/	36	250	833
AAA payments	180	270	210
Total 3/	216	520	1,043

1/ Depreciation and interest on investment.
2/ Income for labor and management of the farmer and family.
3/ Exclusive of that share of the income that comes from the farm.

The possibility of increasing the farm income through the addition of more livestock and another quarter-section of land was next considered. As a result, budgets of a general farm and a cash-grain farm of 480 acres, each were developed for Area I (table 9 and table 27). The 480-acre cash-grain farm showed a return of $520 and the 480-acre general farm, $1,043 (table 8).

Table 9. - Recommended farm organization and estimated annual receipts and expenses for a 480-acre general farm, Area I, Ward County, No. Dak., 1/

Crop Organization

Crop	Acres	Yield per Acre	Production	Operator's share	Feed and Seed	Sales		
						Amount	Price per bu.	Value
						Bu.	Dol.	Dol.
Wheat	100	9 bu.	900	450	208	242	.75	182
Barley	40	20 bu.	800	800	800			
Corn	30	20 bu.	600	600	5	595	.50	298
Oats	30	22 bu.	660	660	463	200	.28	56
Cane	20	3 T.	60	60	60			
Millet	40	1 T.	40	40	40			
Rye	28(will be used for hay or pasture)							
Total Cropland	288							
Native Pasture	176							
Farmstead	16							
Total Acres	480							

Livestock Organization

Livestock	No.	Born	Used in Home	Production per Unit	Sales		
					Amount	Price per lb.	Value
						Dol.	Dol.
Horses	2						
Milk Cows	12		215- lbs. B.F.	200 lbs. B.F.	2 @ 1,100 lbs. 2,185 lbs. B.F.	.05 .30	110 656
Calves		12					
Yearlings	11						
2 year olds	11		1	2 kept 2/	8 @ 1,000 lbs.	.06	480
Bull	1						
Sows	3				3 @ 400 lbs.	.04	48
Pigs		15	4	3 kept 2/	8@ 200 lbs.	.05½	88
Chickens	100	300	3/200 doz. 115 hens	6 dozen 100 kept 2/	400 doz. eggs 145	.15 .50	60 73
Turkeys	10	100	5	10 kept 2/	95 @ 12 lbs.	.20	228

Continued

Table 9. - Recommended farm organization and estimated annual receipts and expenses for a 480-acre general farm, Area I, Ward County, No. Dak., 1/- Con't

Item	Amount	
	Dollars	
Cash Expenses		
Cash Rent	80	
Interest on $\frac{1}{2}$ of inventory $3,325 @ 6% (Borrowed)	100	
Taxes	30	
Feed purchased	138	
Seed purchased	35	
Livestock purchased	30	
Threshing	154	
Twine	24	
Repairs on farm machinery	42	
Tractor	169	
Automobile for farm use	170	
Breeding fees	3	
Medicine and veterinary	10	
Hired labor	210	1,195
Non-cash expenses		
Depreciation on machinery	72	
Depreciation on automobile	80	
Depreciation on tractor	33	
Interest on operator's equity ($1,662 @ 4%)	66	251
Total		1,446

Summary

Item	Amount
	Dollars
Income from livestock and livestock products	1,743
Income from crops	536
Gross cash income	2,279
Cash expenses	1,195
Net cash income	1,084
Non-cash expenses	251
Labor income 4/	833
AAA payments	210
Total	1,043

1/ Landlord gets all wheat on $\frac{1}{4}$ of the acreage devoted to soil-depleting crops, a practice common in this area.

2/ Retained to replace aged breeding stock sold.

3/ Purchased.

4/ Income for labor and management of the farmer and family.

The difference of $523 in favor of the 480-acre general farm is due to the increase in the amount of livestock. It is possible also that the price estimate for butterfat of 30 cents per pound is relatively higher than 75 cents per bushel for wheat. (See table 9 and table 27.) The data show that $1,085, or 93 percent of the gross income received from the cash-grain 480-acre unit, was from crop sales, with only $85, or 7 percent of the gross income, from livestock. In the case of the 480-acre general unit, $536, representing only 24 percent of the gross income, was from crops, while $1,743, or 76 percent, was from sale of livestock and livestock products. Apparently it is the opinion of this farmer committee that farm incomes may be enlarged by increasing livestock numbers. This increase may be gauged more accurately by other farmer planning groups. One should also bear in mind that more labor is required to operate a general farm of this type.

The 480-acre general farm has not been definitely recommended as a minimum unit. However, if such a recommendation is considered, 122 general farms, amounting to slightly more than 11 percent of all farms in Area I and representing almost 6 percent of all farms in the county, will be recognized as inadequate to furnish a satisfactory living. (See table 3.)

It is evident that serious thought should precede final approval of any plan for farm management in Ward County. The 480-acre minimum unit recommendation means surplus farm labor -- dispossessed families -- hardships -- and a relief problem -- at least during a transition period. It is a national and local problem that merits painstaking study by the Ward County planning groups. These groups are not satisfied with a solution that merely consigns the unwanted farmer to that somewhat vague "somewhere else."

Other alternatives which land use planning groups may wish to consider include the addition of more livestock to the cash-grain farm, necessitating the growing of more feed crops and less cash-grain; the addition of more cows; the replacement of present cows with cows of higher production; the addition of more laying hens; or the development of turkey enterprises on the smaller units.

If the income on the smaller units, such as the 320-acre cash-grain unit, cannot be increased to provide an income somewhere near that of the 480-acre general farm unit, it may be necessary for the planning groups to lower their sights somewhat, and redefine the amount of income needed to provide an adequate family income.

Probably the most severe problem area of the county is Area IV. This will probably be the next area in which desirable adjustments in the individual organization of the present farming units will be considered by the county land use planning committee. Area IV has a high acreage of idle tracts of land, a large degree of tenancy, an excessive acreage of cultivated land which should be regrassed, and a large amount of tax delinquency.

In developing desirable farm organizations in the remainder of the county, it will be necessary to consider the available resources of the county in the light of the farm population now living there, or serious repercussions may be expected. Some variations of the pattern developed here should be expected as the Land Use Planning Committee and the County Agricultural Agent continue their work throughout the other areas. But the approach is generally applicable and could be used by other counties that are planning similar work.

SUPPLEMENTARY TABLES

Table 10. - Distribution of farms by size, Ward County, No. Dak., 1900, 1910, 1920, 1925, 1930, and 1935

Acres	1900		1910		1920		1925		1930		1935	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
99 & less	30	2	83	3	61	2	96	4	151	6	181	7
100 - 174	1,385	83	898	32	521	20	552	21	408	15	473	17
175 - 259	30	2	251	9	218	8	216	8	187	7	167	6
260 - 499	176	11	1,215	43	1,327	50	1,280	47	1,171	44	1,226	44
500 - 999	41	2	339	12	457	18	494	18	626	24	626	22
1000-over	8		25	1	59	2	67	2	119	4	111	4
Total farms	1,670	100	2,811	100	2,643	100	2,705	100	2,662	100	2,784	100

Bureau of the Census, Census of the United States: 1900, 1910, 1920, and 1930, and United States Census of Agriculture, 1925, 1935.

Table 11. - Number of farms, size of farms, tenancy of farms, land in farms, population, acres of principal crops and number of livestock, Ward County, N. Dak., 1890, 1900, 1910, 1920, 1925, 1930, 1935, and 1939

Item		1890 1/	1900 1/	1910	1920	1925	1930	1935	1939
Number of farms		228	1,670	2,811	2,643	2,705	2,662	2,784	---
Average acreage per farm		223	198	326	387	387	434	417	---
Farms operated by tenant		2	17	296	615	963	961	1,150	---
Percent of tenants		1	1	10	23	36	36	41	---
Land in farms	acres	50,761	330,847	916,281	1,022,806	1,047,286	1,156,516	1,159,745	---
Total population	number	1,681	7,961	25,281	28,811	---	33,597	---	---
Wheat	acres	2,582	5,181	259,047	289,197	310,687	381,106	217,000	278,000
Rye	do.		54	314	119,421	89,494	63,384	41,000	65,000
Flax	do.	17	2,544	41,922	18,005	31,4[illegible]3	28,607	33,000	7,000
Barley	do.	26	445	10,388	17,613	20,[illegible]57	48,898	42,000	31,000
Corn	do.	96	304	582	1,505	36,701	20,498	43,000	24,000
Oats	do.	300	3,053	73,615	67,285	77,561	48,684	65,000	45,000
Horses	number	718	9,529	19,958	25,439	21,796	17,851	14,000	11,500
Cattle	do.	3,105	2[illegible],150	17,862	32,994	36,279	39,119	30,000	35,500
Hogs	do.	275	1,420	6,755	9,668	18,210	11,750	5,000	7,000
Sheep	do.	1,884	6,677	1,104	6,318	5,259	16,624	10,000	10,000

1/ Includes all of Renville and Burke and a portion of Mountrail Counties.

Bureau of the Census of the United States: 1900, 1910, 1920, 1930, and United States Census of Agriculture, 1925, 1935; the crop acreages for 1935 and all 1939 figures from Agricultural Marketing Service.

Table 12. - Average yearly prices per bushel of principal crops, No. Dak., 1910 - 1939

Year	Wheat	Flax	Oats	Barley	Rye	Potatoes
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
1910	.97	2.11	.38	.50	.62	.68
1911	.88	2.16	.38	.74	.72	.89
1912	.87	1.72	.40	.66	.67	.66
1913	.74	1.18	.28	.40	.48	.40
1914	.86	1.35	.34	.41	.59	.59
1915	1.14	1.62	.38	.50	.92	.46
1916	1.18	2.02	.36	.61	.93	.81
1917	1.88	2.86	.56	.96	1.57	1.66
1918	2.03	3.60	.73	1.04	1.77	1.07
1919	2.25	4.10	.64	.92	1.33	1.14
1920	2.26	3.50	.71	1.02	1.54	2.44
1921	1.13	1.52	.25	.37	.94	.86
1922	1.02	2.09	.26	.37	.66	.70
1923	.90	2.34	.29	.41	.53	.44
1924	1.12	2.18	.37	.55	.70	.54
1925	1.42	2.44	.33	.60	.91	.88
1926	1.37	2.06	.30	.45	.68	1.76
1927	1.20	1.94	.37	.58	.82	1.06
1928	1.03	1.95	.38	.60	.87	.51
1929	.99	2.46	.34	.44	.78	.69
1930	.73	2.12	.26	.34	.43	1.20
1931	.49	1.22	.16	.21	.20	.70
1932	.40	.95	.12	.19	.20	.30
1933	.55	1.30	.18	.24	.38	.45
1934	.83	1.62	.36	.48	.53	.60
1935	.87	1.48	.33	.43	.38	.52
1936	.98	1.66	.27	.44	.50	.80
1937	1.12	1.85	.34	.54	.74	.94
1938	.66	1.64	.19	.33	.36	.42
1939	.60	1.54	.21	.29	.29	.51
Average	1.08	2.02	.35	.52	.73	.82
Average 1/	.92	1.79	.30	.45	.61	.71

1/ 1910-39 average, war-time prices for the years 1917, 1918, 1919 and 1920, excluded.

Fuller, O.M. and Willard, Rex E., Prices of North Dakota Farm Products, Bull. 232, 1929, and Brown, Willard O. and Miller, Cap E., Supplement to Bull. 232, 1937 (Mimeographed); 1937, 1938 and 1939 figures furnished by Brown, Willard O. and Ettesvold, W. S.; No. Dak. Agr. Exp. Sta., Fargo, No. Dak.

Table 13. - Average yearly prices of livestock and livestock products, No. Dak., 1910-1939

Year	Cattle per cwt.	Hogs per cwt.	Sheep per cwt.	Lambs per cwt.	Wool per lb.	Butter-fat per lb.	Chickens per lb.	Eggs per doz.
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
1910	4.10	7.80	4.80	5.80	.21	.27	.10	.22
1911	3.80	5.80	4.00	5.10	.16	.24	.09	.20
1912	4.50	6.40	4.20	5.40	.16	.26	.10	.22
1913	5.40	7.10	4.80	6.00	.16	.27	.11	.21
1914	5.80	6.90	4.80	6.20	.16	.26	.11	.21
1915	5.50	6.00	5.10	6.60	.20	.26	.10	.21
1916	6.00	7.80	6.00	7.60	.26	.30	.11	.24
1917	7.40	13.40	8.60	11.00	.43	.38	.14	.33
1918	8.40	15.40	10.20	12.80	.56	.44	.16	.36
1919	8.60	15.50	9.20	11.90	.48	.52	.17	.40
1920	7.10	12.20	7.70	10.80	.32	.56	.17	.44
1921	4.80	7.00	4.20	6.50	.17	.35	.14	.30
1922	4.80	7.40	5.40	8.60	.24	.32	.14	.25
1923	5.00	6.20	6.00	9.60	.36	.42	.14	.26
1924	4.80	6.40	6.70	10.40	.34	.39	.14	.25
1925	5.10	10.00	7.40	11.80	.36	.40	.14	.30
1926	5.70	11.00	7.20	11.60	.32	.41	.16	.28
1927	6.20	8.80	7.00	11.10	.30	.43	.16	.26
1928	8.20	7.90	7.20	11.50	.35	.45	.16	.27
1929	8.30	8.70	7.20	11.50	.30	.44	.16	.27
1930	6.60	7.90	4.70	7.80	.20	.32	.13	.22
1931	4.60	5.00	2.80	5.60	.12	.24	.11	.15
1932	3.30	2.70	2.10	4.10	.08	.16	.08	.13
1933	2.93	2.82	2.22	4.50	.17	.17	.06	.12
1934	3.08	3.34	2.53	5.57	.20	.22	.08	.16
1935	5.65	7.80	3.40	6.83	.18	.27	.12	.22
1936	5.44	8.36	3.81	7.85	.24	.31	.12	.21
1937	6.60	8.92	4.00	8.48	.28	.32	.12	.20
1938	5.93	7.07	3.33	6.70	.18	.25	.12	.18
1939	6.30	5.80	3.40	7.30	.20	.23	.10	.14
Average	5.66	7.91	5.33	8.22	.26	.33	.12	.24
Average 1/	5.32	6.96	4.78	7.69	.23	.31	.12	.22

1/ 1910-39 average, war-time prices for the years 1917, 1918, 1919 and 1920 excluded.

Fuller, O.M. and Willard, Rex E., Prices of North Dakota Farm Products, Bull. 232, 1929, and Brown, Willard O. and Miller, Cap E., Supplement to Bull. 232, 1937 (Mimeographed); 1937, 1938 and 1939 figures furnished by Brown, Willard O. and Ettesvold, W. S.; No. Dak. Agr. Exp. Sta., Fargo, No. Dak.

Table 14. - Harvested acres of principal crops, Ward County, No. Dak., 1919-38

Year	All spring wheat	Durum wheat	Oats	Corn	Barley	Flax	Potatoes	All tame hay
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
1919	289,000		70,000	8,000	18,000	18,000	7,000	
1920	335,000		80,000	14,000	13,000	20,000	7,500	
1921	318,000		75,000	19,000	13,000	9,000	9,000	
1922	295,000		73,000	25,000	11,000	12,000	10,300	
1923	295,000		71,000	22,000	14,000	22,000	7,000	
1924	324,000		78,000	37,000	21,000	32,000	3,400	
1925	325,000		73,000	28,000	28,000	27,000	2,200	30,000
1926	312,000		51,000	24,000	19,000	21,000	2,300	35,000
1927	370,000		59,000	20,000	22,000	21,000	2,100	25,000
1928	397,000		51,000	20,000	30,000	23,000	3,100	19,000
1929	399,000	86,000	50,000	20,000	50,000	31,000	3,200	20,000
1930	374,000	54,000	43,000	22,000	35,000	47,000	2,100	18,000
1931	39,000	5,000	5,000	24,000	5,000	7,000	1,400	43,000
1932	382,000	21,000	56,000	46,000	35,000	15,000	3,000	34,000
1933	377,000	21,000	58,000	48,000	33,000	10,000	2,400	29,000
1934	54,000	1,000	2,000	46,000	2,000		2,400	27,000
1935	217,000	18,000	65,000	43,000	42,000	33,000	2,200	21,000
1936	147,000	17,000	10,000	32,000	4,000	5,000	1,600	27,000
1937	280,000	9,000	12,000	33,000	17,000	5,000	1,600	27,000
1938	377,000	40,000	44,000	30,000	20,000	4,000	2,200	26,000
Average	295,300	27,200	52,800	28,050	21,600	18,100	3,800	27,214

Compiled from Agricultural Marketing Service.

Table 15. - Yields per harvested acre of principal crops, Ward County, No. Dak., 1919-1938

Year	All spr. wheat	Durum wheat	Oats	Corn	Barley	Flax	Potatoes	Tame Hay
	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Ton
1919	7.3		10.5	21.6	7.0	3.4	54.0	
1920	8.3		18.0	22.5	11.5	3.1	56.0	
1921	8.2		19.0	25.6	14.0	5.8	87.0	
1922	15.8		38.0	28.4	28.0	9.4	98.0	
1923	7.8		22.0	30.0	17.5	9.0	50.0	
1924	15.6		30.0	15.0	24.5	8.6	92.0	
1925	10.6		20.0	17.0	17.0	6.4	68.0	1.2
1926	6.4		13.0	11.0	12.0	4.9	73.0	0.6
1927	14.3		28.0	18.0	27.5	8.3	128.0	1.4
1928	15.8		34.0	19.5	29.0	6.9	105.0	1.4
1929	11.4	10.2	19.5	13.0	15.7	5.1	43.0	1.0
1930	8.7	8.8	14.0	19.0	10.5	3.9	58.0	1.0
1931	2.8	3.2	5.0	12.0	4.5	2.0	30.0	0.4
1932	7.0	5.3	16.5	17.5	12.0	2.7	54.0	0.9
1933	8.3	7.8	11.0	15.5	8.5	3.1	68.0	0.7
1934	3.6	4.0	6.8	2.2	6.2		12.0	0.4
1935	5.9	10.3	26.7	18.0	19.2	5.8	90.0	1.2
1936	2.4	2.9	7.0	2.2	6.0	1.8	47.0	0.5
1937	4.7	4.3	13.0	16.5	10.0	1.6	44.0	0.8
1938	5.6	7.8	19.9	16.0	16.5	2.7	52.0	1.1
Average	8.5	6.5	21.0	17.0	16.0	5.6	69.5	0.8

Compiled from Agricultural Marketing Service.

Table 16. - Acres cultivated and uncultivated per farm by areas, Ward County, No. Dak., 1938

Area	Cultivated		Uncultivated		Average size of farm	
	Acres	Percent	Acres	Percent	Acres	Percent
I	407	75	137	25	544	100
II	288	57	215	43	503	100
III	321	61	206	39	527	100
IV	241	41	349	59	590	100
V	371	73	138	27	509	100
County	344	63	199	37	543	100

Compiled from Agricultural Administration records.

Table 17. - Monthly, annual and growing season precipitation, Minot, Ward County, No. Dak., 1892-1939.1/

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual	Growing Season 2/
							Inches							
1892	0.40	0.68	0.86	2.18	0.61	3.76	2.40	2.36	1.20	0.81	0.73	0.33	16.32	6.77
1893	0.73	0.68	0.88	0.62	1.83	3.80	1.60	1.11	0.85	0.69	0.91	1.65	15.35	7.23
1894	0.30	0.35	1.98	2.86	1.70	2.12	0.12	2.27	1.36	0.90	0.58	0.57	15.11	3.94
1895	0.85	0.90	0.04	1.15	2.76	3.55	3.37	0.02	0.07	0.21	1.00	0.55	14.47	9.68
1896	1.85	0.10	1.20	2.76	3.67	3.55	1.27	1.11	1.71	T	3.17	0.94	21.29	8.49
1897	0.44	0.48	1.82	1.18	0.66	3.38	1.87	0.37	0.23	0.68	0.50	0.29	11.90	5.91
1898	0.06	0.60	0.60	1.55	0.05	3.00	0.25	0.05	0.50	1.90	0.20	0.05	8.81	3.30
1899	0.30	0.15	0.80	1.40	5.31	6.07	2.30	5.20	0.80	1.35	0.55	0.04	24.27	13.68
1900	0.05	0.80	1.30	0.60	0.51	1.58	2.20	3.01	6.29	1.57	0.72	0.19	18.82	4.29
1901	0.60	0.50	0.37	0.74	0.32	5.78	2.82	0.49	3.31	0.22	0.35	0.55	16.05	8.92
1902	T	1.70	0.51	T	1.15	1.50	0.57	1.12	T	0.13	0.05	0.50	7.23	3.22
1903	0.20	T	0.60	2.46	5.56	1.95	T	5.05	3.95	0.90	T	0.50	21.17	7.51
1904	0.20	0.15	1.70	2.90	1.50	4.75	3.20	3.65	1.20	T	0.07	0.70	20.02	9.45
1905	0.35	0.40	T	0.15	1.88	4.69	2.79	2.76	2.59	0.64	1.80	0	18.05	9.36
1906	0.76	0.10	0.15	1.03	5.30	4.86	1.20	1.59	0.53	1.03	3.13	0.87	20.55	11.36
1907	1.42	0.18	.62	.60	0.16	2.13	3.10	1.42	1.01	0.62	0.05	0.36	11.67	5.39
1908	0.03	0.71	0.74	1.56	2.57	2.67	2.33	3.54	1.19	1.05	.96	0.69	18.04	7.57
1909	0.31	0.27	0.51	0.42	2.38	3.20	1.47	0.55	0.49	1.03	0.22	0.88	11.73	7.05
1910	0.05	0.53	1.27	1.88	1.13	0.48	2.28	0.51	0.55	0.67	0.87	0.48	10.70	3.89
1911	0.53	1.14	0.26	0.30	2.09	3.63	1.21	4.87	2.28	1.14	0.46	0.25	18.16	6.93
1912	0.55	0.05	0.60	2.47	4.67	1.62	3.29	1.56	2.13	2.10	0.05	0.24	19.33	9.58
1913	0.50	0.02	0.56	0.94	1.62	1.14	2.00	3.76	1.58	1.05	0.19	T	13.36	4.76
1914	0.35	0.31	0.80	2.01	2.43	9.94	1.32	2.44	0.48	0.30	0.40	0.26	21.04	13.69
1915	0.25	0.20	0.35	0.66	2.94	4.31	1.68	1.32	2.45	0.29	0.87	0.70	16.02	8.93
1916	2.40	0.67	1.35	1.61	0.75	3.29	0.62	2.70	0.87	1.13	0.45	1.70	17.54	4.66
1917	0.30	0.70	T	1.87	0.06	0.97	2.62	1.14	1.24	1.46	0.35	0.95	11.66	3.65
1918	0.43	0.18	0.14	2.25	1.61	0.98	3.11	2.42	0.25	0.44	2.62	1.50	15.93	5.70
1919	0.22	0.80	1.62	1.56	3.11	2.02	0.43	[illegible]	3.18	1.66	1.25	0.30	17.86	5.56

Continued

Table 17. – Monthly, Annual and Growing Season Precipitation, Minot, Ward County, North Dakota, 1892-1939. 1/
Continued

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual	Growing Season 2/
							Inches							
1920	0.60	0.25	1.60	0.77	0.95	3.81	1.20	2.17	1.25	0.48	0.18	0.50	13.76	5.96
1921	0.30	0.50	1.80	1.85	1.49	2.69	2.49	0.77	4.36	0.51	0.74	0.17	17.67	6.67
1922	0.23	2.12	0.60	0.55	2.46	3.60	2.79	1.75	1.12	0.36	3.33	1.33	20.24	8.85
1923	0.15	0.40	0.40	1.66	1.39	3.01	2.33	1.18	1.50	1.52	0.55	0.35	14.44	6.73
1924	0.30	0.45	0.05	1.45	0.87	4.78	1.69	1.66	1.21	2.20	0.02	0.38	15.06	7.34
1925		0.20	0.70	0.76	0.57	3.53	1.00	0.77	2.23	0.72	0.17	0.20	10.88	5.13
1926	0.28	0.25		0.74	2.05	2.06	0.45	2.73	2.89	0.77	0.60	0.60	13.42	4.56
1927	0.40	0.20	0.75	1.67	5.90	2.37	4.08	3.34	0.12	1.45	0.30	0.25	21.33	12.35
1928	0.10		0.40	0.52	1.58	3.86	3.46	2.01	0.80	0.50	T	0.10	13.33	8.90
1929	0.10	0.14	0.29	0.23	3.19	1.16	0.46	0.17	1.31	1.78	0.26	0.57	9.66	4.81
1930	0.05	0.67	0.01	0.45	2.48	4.07	0.30	1.00	1.17	0.86	0.05	0.02	11.13	6.85
1931	0.05	0.05	0.40		1.26	1.65	1.79	3.31	2.78	0.29	0.95	0.02	12.56	4.70
1932	0.37	0.17	0.34	2.40	3.45	4.78	3.63	1.34	0.40	2.24	0.05	0.03	19.20	11.36
1933	0.46	0.12	0.24	2.56	4.13	1.43	2.16	0.63	0.54	0.79	0.79	0.92	14.77	7.72
1934	0.21	0.10	0.42	0.16	0.24	2.45	1.09	0.41	1.32	0.07	0.25	0.41	7.13	3.78
1935	0.87	0.30	0.37	0.80	2.84	1.99	7.20	1.21	0.30	0.05	1.31	0.59	17.83	12.03
1936	0.33	0.69	0.33	0.06	1.23	1.70	0.42	0.78	1.83	0.04	0.20	0.22	7.83	3.35
1937	0.18	0.10	0.04	2.16	1.40	3.94	1.31	1.01	2.31	1.54	0.34	0.51	14.84	6.65
1938	0.49	0.51	0.45	1.09	2.42	2.49	2.88	1.37	0.15	1.18	1.67	0.52	15.22	7.79
1939	0.39	0.52	0.58	0.82	1.65	3.23	1.71	3.06	0.61	0.46	0.09	0.08	13.20	6.59
Average	0.42	0.44	0.65	1.26	2.08	3.11	1.96	1.83	1.47	0.89	0.73	0.49	15.33	7.14

1/ Records for 1893, 1894, 1895 and 1896 from Garrison, North Dakota.
2/ Total for May, June and July.

United States Weather Bureau.

Table 18. - Type of farm by tenure, Areas I, II, III, IV, and V, Ward County, No. Dak., 1938

Areas and tenure	Cash grain	General	Livestock	Self Sufficing	Ranch	Part-time	Total
	Number	Number	Number	Number	Number	Number	Number
Area 1							
Owner	108	64	11	1		38	222
Part Owner	1/ 303	71	8			2	384
Tenant	283	89	12	1		17	402
Total	694	224	31	2		57	1,008
Area II							
Owner	15	23	18	9		19	84
Part Owner	1/ 38	42	18	3	2	2	105
Tenant	38	47	31	6		16	138
Total	91	112	67	18	2	37	327
Area III							
Owner	18	22	1	1		10	52
Part Owner	57	44	10	2	2	3	118
Tenant	44	28	14	3		5	94
Total	119	94	25	6	2	18	264
Area IV							
Owner	8	21	14	3		26	72
Part Owner	43	75	64	4	10	5	201
Tenant	31	57	34	4	6	16	148
Total	82	153	112	11	16	47	421
Area V							
Owner	22	1	1			7	31
Part Owner	46	2	2			1	51
Tenant	26	4	1	1		1	33
Total	94	7	4	1		9	115
County							
Owner	171	131	45	14		100	461
Part Owner	1/ 487	234	102	9	14	13	859
Tenant	422	225	92	15	6	55	815
Total	1,080	590	239	38	20	168	2,135

1/ Includes one cash-crop specialty farm in Areas I and II.

Table 19. - Type of tenure by size, Areas I, II, III, IV and V, Ward County, No. Dak., 1938

Area and tenure	0-240 acres	241-400 acres	401-560 acres	561-721 acres	721-880 acres	881 & over acres	Total
	Number	Number	Number	Number	Number	Number	Number
Area I							
Owner	89	68	39	12	8	6	222
Part Owner	7	49	101	71	60	96	384
Tenant	82	125	93	49	27	26	402
Total	178	242	233	132	95	128	1,008
Area II							
Owner	48	21	10		1	4	84
Part Owner	2	21	22	12	14	34	105
Tenant	44	41	21	19	6	7	138
Total	94	83	53	31	21	45	327
Area III							
Owner	23	19	8	1	1		52
Part Owner	6	17	28	34	15	18	118
Tenant	21	26	19	14	3	11	94
Total	50	62	55	49	19	29	234
Area IV							
Owner	41	21	5	4	1		72
Part Owner	7	36	41	26	29	62	201
Tenant	36	30	34	13	13	22	148
Total	84	87	80	43	43	84	421
Area V							
Owner	18	7	5	1			31
Part Owner		11	15	8	8	9	51
Tenant	3	15	6	5	2	2	33
Total	21	33	26	14	10	11	115
County							
Owner	219	136	67	18	11	10	461
Part Owner	22	134	207	151	126	219	859
Tenant	186	237	173	100	51	68	815
Total	427	507	447	269	188	297	2,135

Table 20. - Average crop organization by size for cash grain and general farms, Area 1, Ward County, No. Dak., 1938

Crop	Cash-grain						General					
	0- 240	241- 400	401- 560	561 720	721- 880	881- over	0- 240	241- 400	401- 560	561- 720	721- 880	881- over
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Wheat	59	149	191	294	315	554	64	95	139	211	204	249
Rye	9	11	29	19	29	55	2	4		13	10	35
Flax							1	6				
Potatoes			2									
Total cash crops	68	160	222	313	344	609	67	105	139	224	214	284
Corn	10	10	17	19	22	40	14	14	30	32	27	59
Oats	1	4	12	13	14	21	17	13	23	38	28	28
Barley	9	13	15	10	28	24	17	25	19	45	33	38
Millet	3	3	10	18	10	21	7	15	11	14	9	21
Alfalfa							4		1		1	
Sweet clover		1	8	6	11	23	2	6	7	22	29	23
Tame Pasture						23	6			17		
Other feed crops		1	2			11		3	3	11	8	14
Total feed crops	23	32	64	66	85	163	67	76	94	179	135	183
Idle	37	63	76	79	108	97	20	46	35	58	122	206
Fallow	3	7	18	46	42	130	9	1	30	23	14	22
Total cultivated	131	262	380	504	579	999	163	228	298	484	485	695
Total Uncultivated	39	66	106	148	224	392	38	107	197	179	319	411
Total Acres	170	328	486	652	803	1,391	201	335	495	663	804	1,106

Compiled from Agricultural Adjustment Administration records.

Table 21. - Average crop organization by size, for general, cash-grain, livestock, and part-time farms, Area 11, Ward County, No. Dak., 1938

Crop	General						Cash-grain					
	0- 240	241- 400	401- 560	561- 720	721- 880	881- over	0- 240	241- 400	401- 560	561- 720	721- 880	881- over
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Wheat	51	88	141	111	252	253	82	126	185	230	349	506
Rye	4	15	16	43	25	20	4	33	22	8	39	42
Flax						2						4
Potatoes						2					5	
Total cash crops	55	103	157	154	277	277	86	159	207	238	393	552
Corn	9	22	28	21	50	59	2	13	19	14	21	40
Oats	16	17	18	30	43	41	2	7	17	14	14	23
Barley	5	16	16	3	42	16	2	7	4	22	10	43
Millet	12	7	29	15	39	32	4	11	5	14	18	45
Alfalfa					1							
Sweet Clover	1	11	27	24	10	16		3	1	15	10	29
Tame pasture	1										1	7
Other feed crops		1	7	5	4	7	1	1	1	1	24	7
Total feed crops	44	74	125	98	189	171	11	42	47	80	98	194
Idle	6	17	55	59	38	124	12	29	69	154	76	114
Fallow	3	2	5	45	18	21	6	7	4	12	45	80
Total cultivated	108	196	342	356	522	593	115	237	327	484	612	940
Total uncultivated	70	147	156	294	305	588	51	106	177	148	189	415
Total acres	178	343	498	650	827	1,181	166	343	504	632	801	1,355

Continued

Table 21. - Average crop organization by size for general, cash-grain, livestock and part-time farms, Area 11, Ward County, No. Dak., 1938 - continued

Crop	Livestock						Part-time					
	0- 240	241- 400	401- 560	561- 720	721- 830	881- over	0- 240	241- 400	401- 560	561- 720	721- 380	881- over
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Wheat	19	44	64	55	186	183	32	65	69			596
Rye	1	7	1	12		37	1					57
Flax							1					
Potatoes						3						
Total cash crops	20	51	65	67	186	223	34	65	69			653
Corn	22	31	23	26	50	31	3	1	12			22
Oats	21	15	36	38	207	66	8		6			
Barley	7	17	24	22		59	1		35			50
Millet	12	25	25	21	2	50	1	5				47
Alfalfa			7									
Sweet clover	2	15	5	44		90			5			45
Tame pasture	1	4	6			7						
Other feed crops	2	11	7			30	1					
Total feed crops	67	118	133	151	259	333	14	6	58			164
Idle	8	16	29	10		141	13	70	21			54
Fallow			5	7		10	3	4				136
Total cultivated	95	185	232	235	445	707	64	145	148			1,007
Total uncultivated	58	132	240	445	400	1,269	77	186	372			692
Total acres	153	317	472	680	845	1,976	141	331	520			1,699

Compiled from Agricultural Adjustment Administration records.

Table 22. - Average crop organization by size for cash-grain, general, and livestock farms, Area 111, Ward County, No. Dak., 1938

Crop	Cash-grain						General					
	0-240	241-400	401-560	561-720	721-880	881-over	0-240	241-400	401-560	561-720	721-880	881-over
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Wheat	68	124	196	233	274	495	54	95	115	157	208	268
Rye	9	18	7	7	20	21	1	4	4	14	61	22
Flax		3										
Total cash crops	77	145	203	240	294	516	55	99	119	171	269	290
Corn	3	7	18	11	19	20	2	13	35	20	25	27
Oats	3	7	10	5	17	30	2	19	12	5	22	29
Barley	2	14	9	23	23	34	15	15	24	45	56	52
Millet	7	5	15	17	8	15	14	14	13	21	33	16
Alfalfa												2
Sweet clover	3	4	9	11	2	30	5	2	5	23	7	20
Tame pasture		1			2	2		11	2	9	11	12
Other feed crops				1		4		2	1		3	
Total feed crops	18	58	61	68	71	135	38	76	92	123	157	158
Idle	35	34	41	90	120	132	13	47	74	38	51	120
Fallow	3	18	36	25	82	111	6	2	8	42	70	70
Total cultivated	135	235	341	425	567	944	112	224	293	374	547	638
Total uncultivated	55	81	150	220	236	494	74	110	195	295	293	474
Total acres	188	316	491	643	803	1,438	186	334	488	669	840	1,112

Continued

Table 22. - Average crop organization by size for cash-grain, general, and livestock farms, Area III, Ward County, No. Dak., 1938 - continued

Crop	Livestock					
	0- 240	241- 400	401- 560	561- 720	721- 880	881- over
	Acres	Acres	Acres	Acres	Acres	Acres
Wheat	33	29	49	115	51	10
Rye		4	1	6	18	59
Flax						
Total cash crop	33	33	50	121	69	69
Corn	6	12	5	18	11	39
Oats	18			34	3	
Barley	18	16	36	35	28	28
Millet	4	6	20	10	10	
Alfalfa						
Sweet clover	7	6		6	12	
Tame pasture						
Other feed crops	1			46	4	
Total feed crops	54	40	61	149	68	67
Idle	13	23	23	65	77	35
Fallow	1	4	3	6		40
Total cultivated	101	100	137	341	214	211
Total uncultivated	82	229	343	320	609	709
Total acres	183	329	480	661	823	920

Compiled from Agricultural Adjustment Administration records.

Table 23. - Average crop organization by size groups for livestock, cash grain, general farms and ranches, Area IV, Ward County, No. Dak., 1938

	Livestock						Cash Grain					
Crop	0- 240	241- 400	401- 560	561- 720	721- 880	881- over	0- 240	241- 400	401- 560	561- 720	721- 880	881- over
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Wheat	22	33	52	71	77	109	59	100	106	228	262	357
Rye	1		1		6		3	1	30	13	5	6
Flax			3						1		6	
Total Cash crops	23	33	56	71	83	109	62	101	137	241	273	363
Corn	7	11	12	21	17	23	3	4	7	17	14	19
Oats		14	11	19	13	24	6	4		17	16	6
Barley	9	7	17	12	14	8	2	6	17	15	21	42
Millet	11	8	6	9	23	13	5	2	5	18	9	10
Alfalfa			4									
Sweet Clover		3	4	19	8	43		2	4	4	1	5
Tame pasture			4						7		4	
Other Feed Crops		3	4	1	16	10				5	8	5
Total Feed Crops	27	46	62	81	91	121	16	18	40	76	73	87
Idle	10	27	46	72	53	75	21	44	111	18	91	171
Fallow			3	6		8	6	37	10	42	32	25
Total Cultivated	60	106	167	230	227	313	105	200	298	377	469	646
Total Uncultivated	74	231	307	417	567	746	74	130	182	258	341	439
Total Acres	134	337	474	647	794	1,059	179	330	480	635	810	1,085

Continued

Table 23. - Average crop organization by size groups for livestock, cash grain, general farms and ranches, Area IV, Ward County, No. Dak., 1938 - continued

Crops	General						Ranch					
	0- 240	241- 400	401- 560	561- 720	721- 880	881- over	0- 240	241- 400	401- 560	561- 720	721- 880	881- over
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Wheat	47	76	86	134	149	250					13	72
Rye		4	14	6	5	10						
Flax			2		1	2						
Total Cash Crops	47	80	102	140	155	262					13	72
Corn	6	9	12	15	12	33					5	16
Oats	10	19	13	11	15	26						11
Barley	9	9	14	20	19	38					4	17
Millet	14	6	17	14	10	23					14	7
Alfalfa		2										
Sweet Clover		9	7	13	9	15						2
Tame Pasture		5			7	8						
Other Feed Crops		4	4			1						
Total Feed Crops	39	63	67	73	72	144					23	53
Idle	18	49	41	76	97	125					41	40
Fallow	5	12	9	13	19	34						3
Total Cultivated	109	204	219	302	343	565					77	168
Total Uncultivated	70	123	266	329	452	668					753	1,454
Total Acres	179	327	485	631	795	1,233					830	1,622

Compiled from Agricultural Adjustment Administration records.

Table 24. - Average crop organization by size for cash-grain farms, Area V, Ward County, No. Dak., 1938

Crop	0-240	241-400	401-560	561-720	721-880	881-over
	Acres	Acres	Acres	Acres	Acres	Acres
Wheat	90	153	223	308	380	430
Rye	5	2	21	10	18	45
Flax			4			20
Total cash crops	95	155	248	318	398	495
Corn	3	4	7	4	2	16
Oats	4	6	12	5	19	26
Barley		5	9	4	10	17
Millet	5	9	7	16	19	19
Alfalfa		1	4	1		
Sweet clover		2	6	4	19	
Tame pasture						
Other feed crops		1	2	4	5	6
Total feed crops	12	28	47	38	74	84
Idle	19	74	86	99	109	145
Fallow	11	7	27	43	31	39
Total cultivated	137	264	408	498	612	763
Total uncultivated	23	61	82	145	199	439
Total acres	160	325	490	643	811	1,202

Compiled from Agricultural Adjustment Administration records.

Table 25. - Use of cultivated acres and total acres in percent for type of farms by size, Area I, II, III, IV, and V, Ward County, No. Dak., 1938

Type and Size	Percent of Cultivated Acres: Cash Crops	Feed Crops	Idle	Fallow	Total Cultivated	Percent of Total Acres: Cultivated	Uncul-tivated	Total Acres
Cash Grain, Area 1								
0 - 240	52	18	28	2	100	77	23	100
241-400	61	12	24	3	100	80	20	100
401-560	58	17	20	5	100	78	22	100
561-720	62	13	16	9	100	77	23	100
721-880	59	15	19	7	100	72	28	100
880-over	61	16	10	13	100	72	28	100
General, Area 1								
0 - 240	41	41	12	6	100	81	19	100
241-400	46	33	20	1	100	68	32	100
401-560	47	31	12	10	100	60	40	100
561-720	46	37	12	5	100	73	27	100
721-880	44	28	25	3	100	60	40	100
881-over	41	26	30	3	100	63	37	100
General, Area 11								
0 - 240	51	40	6	3	100	61	39	100
241-400	53	37	9	1	100	57	43	100
401-560	46	37	16	1	100	69	31	100
561-720	43	27	17	13	100	55	45	100
721-880	53	37	7	3	100	63	37	100
881-over	46	29	21	4	100	50	50	100
Cash Grain, Area 11								
0 - 240	75	10	11	4	100	69	31	100
241-400	67	18	12	3	100	69	31	100
401-560	63	14	21	2	100	65	35	100
561-720	49	17	32	2	100	77	23	100
721-880	64	16	13	7	100	77	23	100
881-over	59	21	12	8	100	69	31	100
Livestock, Area 11								
0 - 240	21	71	8		100	62	38	100
241-400	28	63	9		100	58	42	100
401-560	28	57	13	2	100	49	51	100
561-720	29	64	4	3	100	35	65	100

Continued

Table 25. - Use of cultivated acres and total acres in percent for type of farms by size, Area 1. 11, 111, 1V, and V, Ward County, No. Dak., 1938 - continued

Type and Size	Percent of Cultivated Acres: Cash Crops	Feed Crops	Idle	Fallow	Total Cultivated	Percent of Total Acres: Cultivated	Uncultivated	Total Acres
721-880	42	58			100	53	47	100
881-over	32	47	20	1	100	36	64	100
Part Time, Area 11								
0 - 240	54	22	19	5	100	45	55	100
241-400	45	4	48	3	100	44	56	100
401-560	47	39	14		100	28	72	100
561-720								
721-880								
881-over	65	16	5	14	100	59	41	100
Cash Grain, Area 111								
0 - 240	58	13	26	3	100	71	29	100
241-400	62	16	14	8	100	74	26	100
401-560	59	18	12	11	100	69	31	100
561-720	57	16	21	6	100	66	34	100
721-880	52	13	21	14	100	71	29	100
881-over	55	14	19	12	100	66	34	100
General, Area 111								
0 - 240	49	34	11	6	100	60	40	100
241-400	44	34	21	1	100	67	33	100
401-560	41	31	25	3	100	60	40	100
561-720	46	33	10	11	100	56	44	100
721-880	49	29	9	13	100	65	35	100
881-over	45	25	19	11	100	57	43	100
Livestock, Area 111								
0 - 240	33	53	13	1	100	55	45	100
241-400	33	40	23	4	100	31	69	100
401-560	36	45	17	2	100	29	71	100
561-720	35	44	19	2	100	52	48	100
721-880	32	32	36		100	26	74	100
881-over	32	32	17	19	100	23	73	100
Livestock, Area 1V								
0 - 240	38	46	16		100	45	55	100
241-400	31	43	26		100	31	69	100
401-560	33	37	28	2	100	35	65	100
561-720	31	35	31	3	100	36	64	100

Continued

Table 25. - Use of cultivated acres and total acres in percent for type of farms by size, Area 1, 11, 111, lV and V, Ward County, No. Dak., 1938 - continued

	Percent of Cultivated Acres					Percent of total acres		
Type and Size	Cash Crops	Feed Crops	Idle	Fallow	Total Cultivated	Cultivated	Uncultivated	Total Acres
721-880	37	40	23		100	29	71	100
881-over	35	38	24	3	100	30	70	100
Cash Grain, Area lV								
0 - 240	59	15	20	6	100	59	41	100
241-400	51	9	22	18	100	61	39	100
401-560	46	14	37	3	100	62	38	100
561-720	64	20	5	11	100	59	41	100
721-880	58	16	19	7	100	58	42	100
881-over	56	13	27	4	100	60	40	100
General, Area lV								
0 - 240	43	36	16	5	100	61	39	100
241-400	39	31	24	6	100	62	38	100
401-560	46	31	19	4	100	45	55	100
561-720	47	24	25	4	100	48	52	100
721-880	45	21	28	6	100	43	57	100
881-over	46	26	22	6	100	46	54	100
Ranches, Area lV								
721-880	17	29	54		100	9	91	100
881-over	43	31	24	2	100	10	90	100
Cash Grain, Area V								
0 - 240	69	9	14	8	100	86	14	100
241-400	59	10	28	3	100	81	19	100
401-560	61	11	21	7	100	83	17	100
561-720	64	7	20	9	100	78	22	100
721-880	65	12	18	5	100	76	24	100
881-over	65	11	19	5	100	64	36	100

Compiled from Agricultural Adjustment Administration records.

Table 26. - Average farm organization and estimated annual receipts and expenses for a 320-acre cash grain farm, Area 1, Ward County, No. Dak.

Crop Organization

Crop	Acres	Yield per acre	Production	Operator's share	Feed and seed	Sales: Amount	Price per bu.	Value
						Bu.	Dol.	Dol.
Wheat	100	9 bu.	900	675	145	530	.75	398
Rye	30	9 bu.	270	202	30	172	.52	89
Barley	25	19 bu.	475	356	382			
Oats	20	22 bu.	440	330	268	62	.28	17
Millet	15	1 T.	15	15	15			
Sorghum	10	2 T.	20	20	20			
Summer fallow	54							
Garden	1							
Total cropland	255							
Native pasture	50							
Farmstead	15							
Total Acres	320							

Livestock Organization

Livestock	No.	Born	Used in Home	Production per Unit	Sales: Amount	Price per lb.	Value
						Dol.	Dol.
Horses	2						
Milk cows	6		215-lbs. B.F.	200 lbs. B.F.	1 @ 1,100	.04	44
					985 lbs. B.F.	.30	296
Calves		6					
Yearlings	5		1	1 kept 1/	3 @ 625 lbs.	.06	112
Sows	1				1 @ 400 lbs.	.04	16
Pigs		5	4	1 kept 1/			
Chickens	50	150 2/	200 doz.	6 dozen	100 doz. eggs	.15	15
			60 hens	50 kept 1/	60	.50	30

Continued

Table 26. - Average farm organization and estimated annual receipts and expenses for a 320-acre cash grain farm, Area 1, Ward County, No. Dak.-Cont'd

Item	Amount	
	Dollars	
Cash expenses		
Cash rent	37	
Interest on ½ of inventory, $2,042 @ 6% (Borrowed)	61	
Taxes	20	
Feed purchased	30	
Seed purchased	18	
Livestock purchased	15	
Threshing	151	
Twine	24	
Repairs on farm machinery	30	
Tractor	142	
Feed grinding	26	
Automobile for farm use	170	
Breeding fees	13	
Medicine and veterinary	5	
Hired labor	20	762
Non-cash expenses		
Depreciation on machinery	65	
Depreciation on automobile	80	
Depreciation on tractor	33	
Interest on operator's equity ($1,021 @ 4%)	41	219
Total		981

Summary

Item	Amount
	Dollars
Income from crops	504
Income from livestock and livestock products	513
Gross cash income	1,017
Cash expenses	762
Net cash income	255
Non-cash expenses	219
Labor income 3/	36
AAA payments	180
Total	216

1/ Retained to replace aged breeding stock sold.
2/ Purchased.
3/ Income for labor and management of the farmer and family.

Table 27. - Recommended farm organization and estimated annual receipts and expenses for a 480-acre cash grain farm, Area 1, Ward County, No. Dak.

Crop Organization

Crop	Acres	Yield per Acre	Production	Operator's share	Feed and Seed	Sales Amount	Sales Price per bu.	Sales Value
						Bu.	Dol.	Dol.
Wheat	155	9 bu.	1,395	1,046	185	861	.75	646
Rye	40	9 bu.	360	270	40	230	.52	120
Barley	50	19 bu.	950	712	197	515	.35	180
Oats	20	22 bu.	440	330	170	160	.28	45
Flax	15	5 bu.	75	57	5	52	1.80	94
Millet	15	1 T.	15	15	15			
Fallow	85							
Total cropland	380							
Native pasture	65							
Native hay	10							
Farmstead	25							
Total Acres	480							

Livestock Organization

Livestock	No.	Born	Used in home	Production per Unit	Sales Amount	Sales Price per lb.	Sales Value
						Dol.	Dol.
Cows	2		300-lbs.B.F.	150 lbs.B.F.			
Calves		2					
Yearlings	2		1		1@ 700 lbs.	.06	42
Chickens	50	150 2/	200 doz. 65 hens	6 dozen 50 kept 1/	100 doz. eggs 60	.15 .47	15 28

Continued

Table 27. - Recommended farm organization and estimated annual receipts and expenses for a 450-acre cash grain farm, Area 1, Ward County, No. Dak. Cont'd

Item	Amount	
	Dollars	
Cash Expenses		
Interest on ½ of inventory, $1,652 @ 6% (Borrowed)	50	
Taxes	15	
Feed purchased	21	
Seed purchased	19	
Livestock	15	
Combining	150	
Repairs on farm machinery	48	
Tractor	119	
Automobile	170	
Breeding fees	4	
Medicine and veterinary	3	
Hired labor	33	657
Non-cash expenses		
Depreciation on machinery	100	
Depreciation on automobile	80	
Depreciation on tractor	50	
Interest on operator's equity ($826 @ 4%)	33	263
Total		920

Summary

Item	Amount
Income from crops	1,085
Income from livestock and livestock products	85
Gross cash income	1,170
Cash expenses	657
Net cash income	513
Non-cash expenses	263
Labor income 3/	250
AAA payments	270
Total	520

1/ Retained to replace aged breeding stock sold.

2/ Purchased.

3/ Income for labor and management of the farmer and family.

METHODOLOGY AND SCOPE OF THE STUDY

The Ward County Land Use Planning Committee, in December 1939, requested technical guidance from the Bureau of Agricultural Economics. The request was for aid in developing recommendations for suitable sizes and types of farms for the different areas within the county.

To provide background material, representatives of the Bureau assembled, compiled, and prepared for presentation material that would aid planning groups in determining desirable farm organizations for desirable economic units in the different type-of-farming areas within the county. The data on organization of individual farms were collected largely through a W.P.A. Project, sponsored by the North Dakota Extension Service and the North Dakota Experiment Station. A representative of the Bureau of Agricultural Economics developed a procedure for the work, and furnished technical guidance.

Information showing trends in agriculture was obtained, and included data on rainfall, prices, crop acreages, crop yields, livestock numbers, percentage of farm tenancy. Other historical information was obtained from the agricultural census.

Additional data obtained from the files of the (Ward County Agricultural Adjustment Administration) consisted of material pertaining to the size of each farm, acreages of cropland, acreages of pasture land, and the legal description of farming units. A map showing the geography of crop and noncrop land was developed from the aerial maps of the Ward County Agricultural Adjustment Administration. The farm organization of each farm was entered in condensed form on individual cards. (This made possible the making of numerous arrays.)

Because of the close relation of economic problems to soil, a map showing soil type and one showing soil topography were developed from the Soil Conservation Service survey of erosion conditions for Ward County.

The farm organization data used in classifying farms by type were obtained from the files of the (Ward County Agricultural Adjustment Administration Office) and the Ward County Assessor's Office. This material consisted of data on crop organization obtained from the Agricultural Conservation files. Data on livestock organization had been obtained from the assessor's office; but these livestock data were found to be too inaccurate for use in classifying farms by type. Therefore, it was necessary to develop a classification based entirely upon land use and crop organization. Classifications were developed for the following types of farms based on land use and acreages of principal crops; stock ranches, livestock farms, general farms, cash-grain farms, cash-crop specialty farms, self-sufficing farms, and part-time farms. Farms were then classified according to their predominant type of cropping system--that is, whether or not either feed crops or cash crops constituted 60 percent or more of all land in crops.

Stock ranches consisted of operating units of more than 1,000 acres, in which 80 percent or more of all land was in native grass.

Livestock farms consisted of operating units in which less than 80 percent of the acreage was in native grass, and in which the only predominant cropping system was feed crops and livestock.

Cash-crop farms consisted of operating units in which less than 80 percent of the total acreage was in native grass and in which the predominant cropping system was cash crops. Cash-crop farms were then divided into cash-grain farms and cash-crop specialty farms. The farms in which 40 percent or more of the crop acreage was devoted to production of specialty crops were classified as cash-crop specialty farms and the remainder as cash-grain farms.

General farms consisted of operating units in which less than 80 percent of the acreage was in native grass and on which there was no predominant type of cropping system.

Part-time farms consisted of farms in which the operator had other sources of income of a nonagricultural nature.

Units were classified as self-sufficing farms when it appeared that the farm was devoted almost entirely to the production of feed and food for home consumption.

The units of less than 1000 acres with 80 percent or more in grass and which did not meet the above classifications were divided on the basis of size into ranches and livestock farms. Units averaging 700 to 1000 acres were classified as ranches and those of less than 700 acres as livestock farms.

On farms not classified as ranches, it was believed necessary to convert the pasture acreages to their equivalent in feed-crop acreages insofar as grass was able to replace feed-crops. This conversion factor was developed on a crop-reporting-district basis and was the ratio between the number of feed units produced per average acre of cropland and the number of feed units produced per average acre of native grassland for that district.

After the farms were classified by type they were mapped by appropriate symbols on an outline map of Ward County. Through the use of this map, it was possible to draw boundary lines delineating areas having farm organizations of a similar nature.

The delineation of the county into five type-of-farming areas provided a basis for a closer analysis of the economic and physical conditions of farms in each area. An analysis of the soils, topography, type and size of farms, tenure, and average farm organization of each size group within the predominant type groups has been made for each area.

Average farm organizations on an acre and a percentage basis, have been calculated for the principal size groups for each type class found in the specific areas. The tables on average farm organizations will facilitate the development of farm budgets by planning groups. It is expected that such material will aid planning groups in developing farm budgets, in that it serves as a guide for practical farm planning within the area. These tables show the difference in farm organization between the different size groups and size of farms.

Two meetings with one farm planning group have been held in Ward County by farmers living within type-of farming Area I. The county agent acted as chairman with the representative of the Bureau of Agricultural Economics acting in the capacity of a technical assistant. Three budgets were developed at the two meetings. These consisted of a 320-acre cash-grain farm, a 480-acre cash-grain farm, and a 480-acre general farm. The assistance already given in the development of farm budgets will place the agent in a position to carry on the work in the remaining areas. The material used in Area I, and additional material included within this report, will be used in developing farm budgets for the other areas of the county.

It is expected that other counties in North Dakota will use similar methods in developing farm budgets. Possibly different data or additional background material will be needed when coping with the specific problems of the other counties. It is almost impossible to develop a stereotype to fit all areas, because individual problems of each county must be considered.